Section 4 Zone 8 Kewalo (Test Excavations 162 to 178A)

4.1 Overall Location

For reporting purposes for this AIS, the City Center Section 4 of the HHCTCP has been divided into 11 zones based on geographical and cultural boundaries. The Kewalo Geographic Zone is located within the eastern portion of Honolulu Ahupua‘a, Honolulu District, Island of O‘ahu, in a physiographic division known as the Honolulu Plain (Armstrong 1983:36). The Kewalo portion of the City Center Section 4 route extends approximately 460 m from Ward Avenue at Halekauwila Street on the west arcing slightly north (*mauka*) to continue east along the *makai* side of Queen Street to Kamake‘e Street (Figure 26). As part of the City Center AIS, a total of 24 test excavations (T-162 through T-178, T-168A, T-168B, T-170A, T-172A, T-174A, T-175A, and T-178A) were excavated in the Kewalo Zone between Ward Street and Kamake‘e Street.

While this portion of the route crosses City and County property at Ward Avenue, all of the Kewalo Zone test excavations are on private lands with T-162 through T-169, T-168A, and T-168B located within TMK [1] 2-3-002:059 and T-170 through T-177, T-170A, T-172A, T-174A, T-175A, and T-178A located within TMK [1] 2-3-002:001(owned by Victoria Ward, Ltd.) and T-178 located within TMK [1] 2-3-003:087 (owned by the Hawaii Community Development Authority).

4.2 Transit Infrastructure

HHCTCP facilities for the current project within the Kewalo Zone include the Kaka‘ako Station, on the east side of Ward Avenue (just east of Halekauwila Street and north of the present Ross Dress for Less store). The Kaka‘ako Station is primarily an elevated platform over the north corner of the present Ross Dress for Less store with a Station Entrance Building adjacent on the north side and an adjacent Station Ancillary Building on the east side. The transit corridor crosses to the east side of Ward Avenue on single columns, but the very first column on the east side of Ward Avenue is a support column for the Kaka‘ako Station. Heading east from the Kaka‘ako Station the route continues on Kamake‘e Street on single columns.

Ten of the excavations (T-162 to T-169, T-168A, and T-168B) tested the station complex footprint, 12 of the test excavations tested guideway columns (T-170 to T-173, T-170A, T-172A, T-175 to T-178, T-175A, and T-178A) and two test excavations (T-174 and T-174A) tested an electric line relocation corridor (see Vol. I).

4.3 Geography, Geology, and Land Forms

The Kewalo Zone is situated along the low-lying coastal flats immediately inland of present day Kewalo Basin (approximately 500 m inland from the natural coastline at the edge of today’s Ala Moana Boulevard) and is relatively flat. The Kewalo Zone consists of a portion of the broad elevated coral reef in southern Oahu that probably formed during the 7.5-meter (Waimanalo) stand (Macdonald et al. 1983:420-421). Present day elevations in the zone range from approximately 1.3 m to 2.2 m above mean sea level. Early maps, such as an 1884 map of Honolulu by S. E. Bishop (Figure 27), indicate that the vicinity of the Kewalo Zone was a little

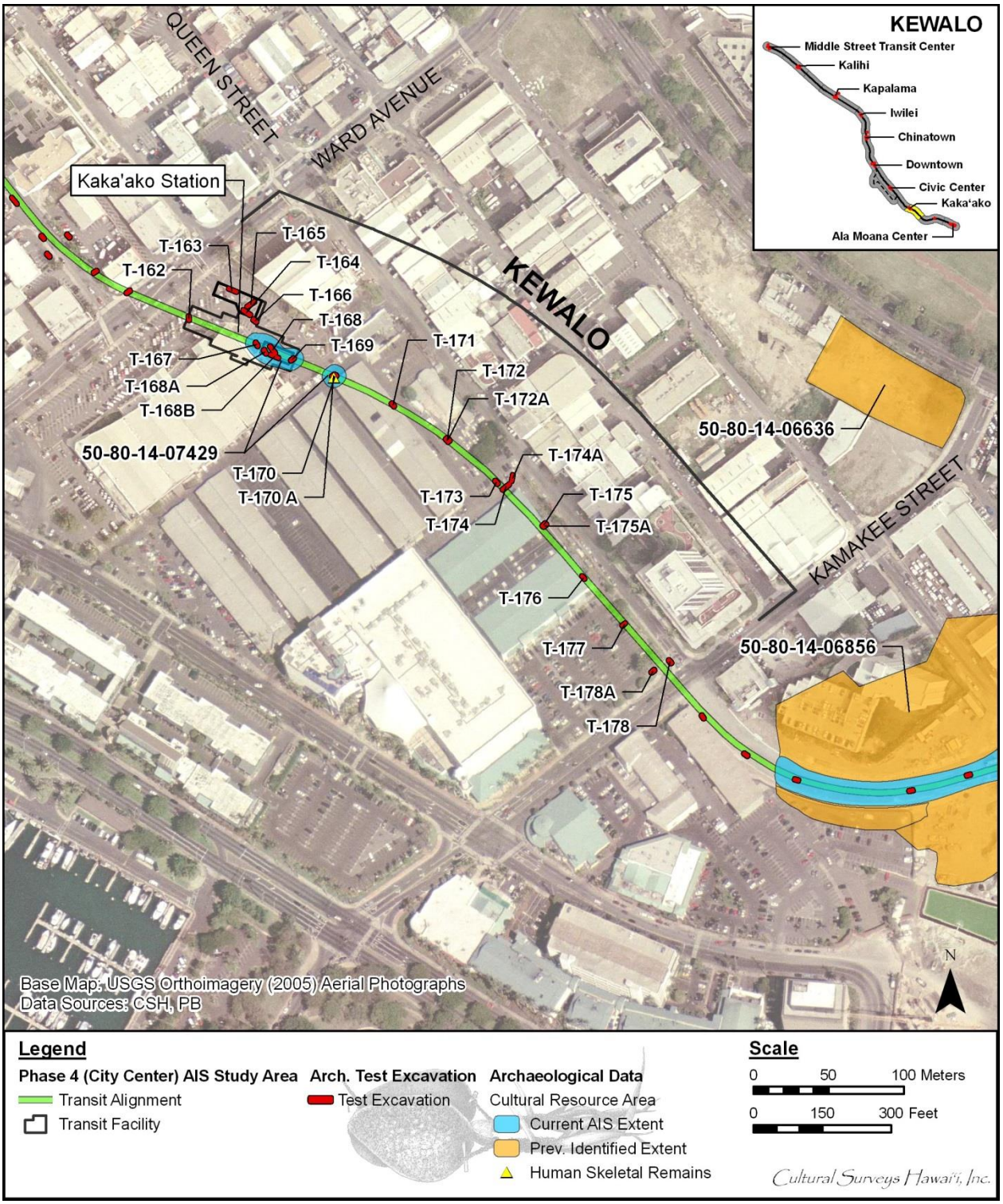


Figure 26. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005) showing the location of the Kewalo Zone AIS test excavations along the transit corridor and at the Kaka‘ako Station

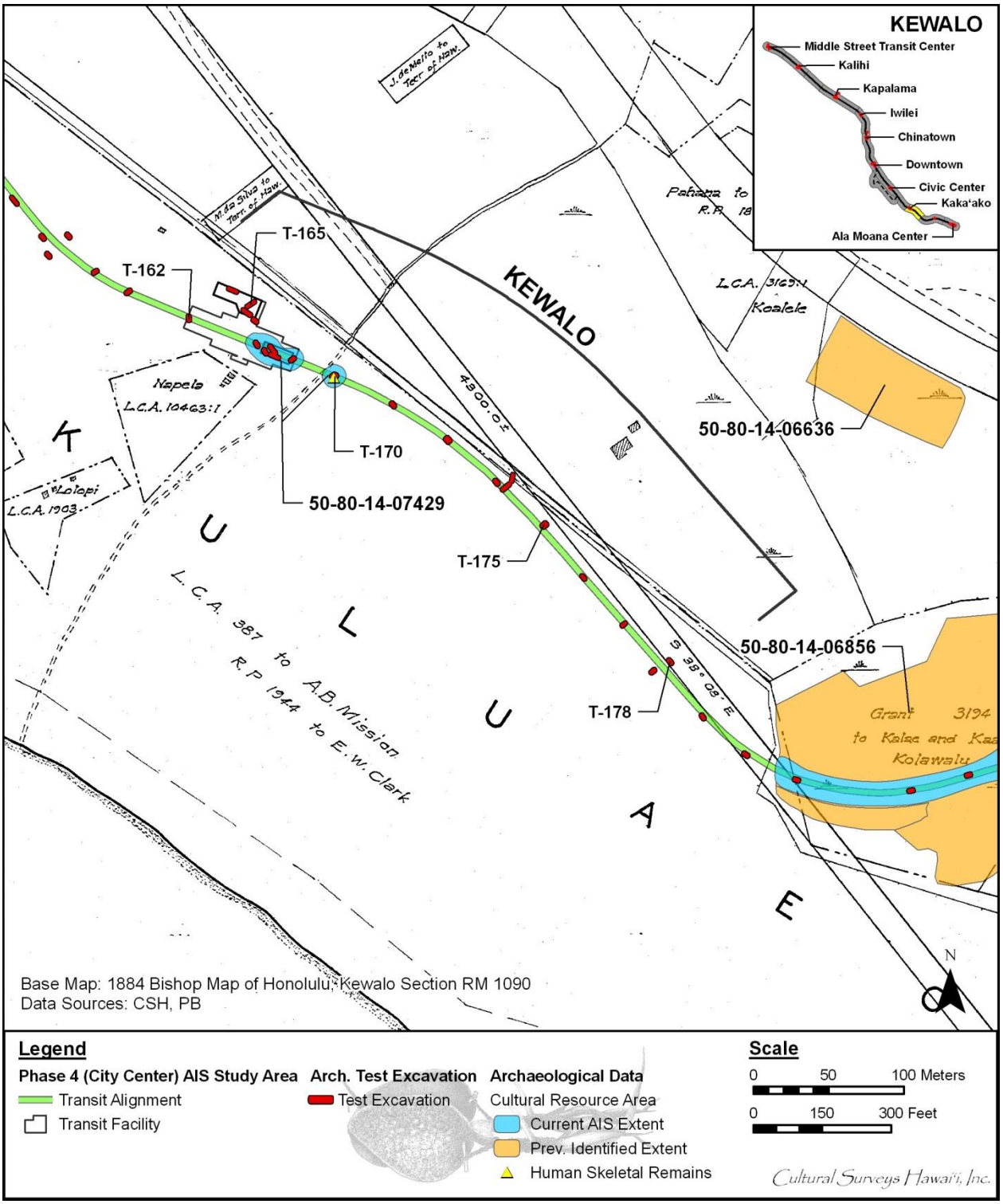


Figure 27. 1884 map of Honolulu, Kewalo Section, by S. E. Bishop (RM 1090) showing LCAs in the vicinity of the transit corridor and Kaka‘ako Station AIS test excavations in the Kewalo Zone

higher than the extensive marshes to the northwest. It seems probable that the Kewalo Zone occupied a low coastal dune that was a factor in backing up this shallow marsh.

The average annual rainfall measures 663 to 679 mm (26 to 27 inches) (Giambelluca et al. 2011), which would be marginal at best for non-irrigated agriculture. There were no perennial streams between Nu‘uanu Stream 2 km to the west and the former Pi‘inaio Stream (that ran roughly north/south (*mauka/makai*) along the present eastern portion of Ala Moana Boulevard before debouching near the present Ala Wai Boat Harbor) approximately 1.5 k to the east. Kanaha Stream originating in Makiki Valley meandered and dissipated through the marshy Makiki coastal lands. Kewalo was well-known for freshwater springs, as seen in the proverb "*Ka wai huahua‘i o Kewalo*," which translates as "The bubbling water of Kewalo." There were also a number of medium-sized fishponds to the northeast and northwest.

Native vegetation in this area is not well documented, but just prior to development in the early twentieth century is understood as including *naupaka* (*Scaevola taccada*), *keawe* (*Prosopis pallida*), and coconut (*Cocos nucifera*). Today, virtually all vegetation is the result of landscaping efforts.

According to the U.S. Department of Agriculture Soil Survey Geographic (SSURGO) Database (2001) and soil survey data gathered by Foote et al. (1972), soils within the Kewalo Zone consist exclusively of Fill land (FL) (Figure 28). Fill land soils are described as:

> …areas filled with material dredged from the ocean or hauled from nearby areas, garbage, and general material from other sources… This land type is used for urban development including airports, housing areas, and industrial facilities [Foote et al. 1972:31].

The topography in the vicinity was relatively featureless. There was a particularly pronounced channel through the reef (resulting from an ancient alignment of Kanaha Stream) that was later developed for Kewalo Basin that was probably a significant focus for canoe anchorage and fishing expeditions (as it remains today).

4.4 Traditional and Historic Land Use

4.4.1 Traditional Accounts of the Kewalo Zone

The designated Kewalo Zone lies near the interface of an immediately coastal stretch traditionally known as Kukuluāe‘o and an adjacent *mauka* area known as Kewalo, with the coastal lands of Ka‘akaukukui 400 m to the west and the coastal lands of Kālia 700 m to the east (see Vol. II Figure 3 and Figure 4). By the end of the nineteenth century the name "Kewalo" had come to subsume many of the names for adjacent areas.

The coastal lands of Kewalo and Kukuluāe‘o appear to have always been sparsely populated compared to the lands that would become Honolulu (further to the west) and the lands of Waikīkī to the southeast.

Perhaps Kewalo is most famous in legends for the drowning of members of a pariah caste (*kauwā*) or *kapu* (taboo) breakers as the first step in a sacrificial ritual known as *Kānāwai Kaihehe‘e* (Kamakau 1991:6) or *Ke-kai-he‘ehe‘e*, which translates as "sea sliding along," suggesting the victims were slid under the sea (Westervelt 1963:16). Kewalo is described as:

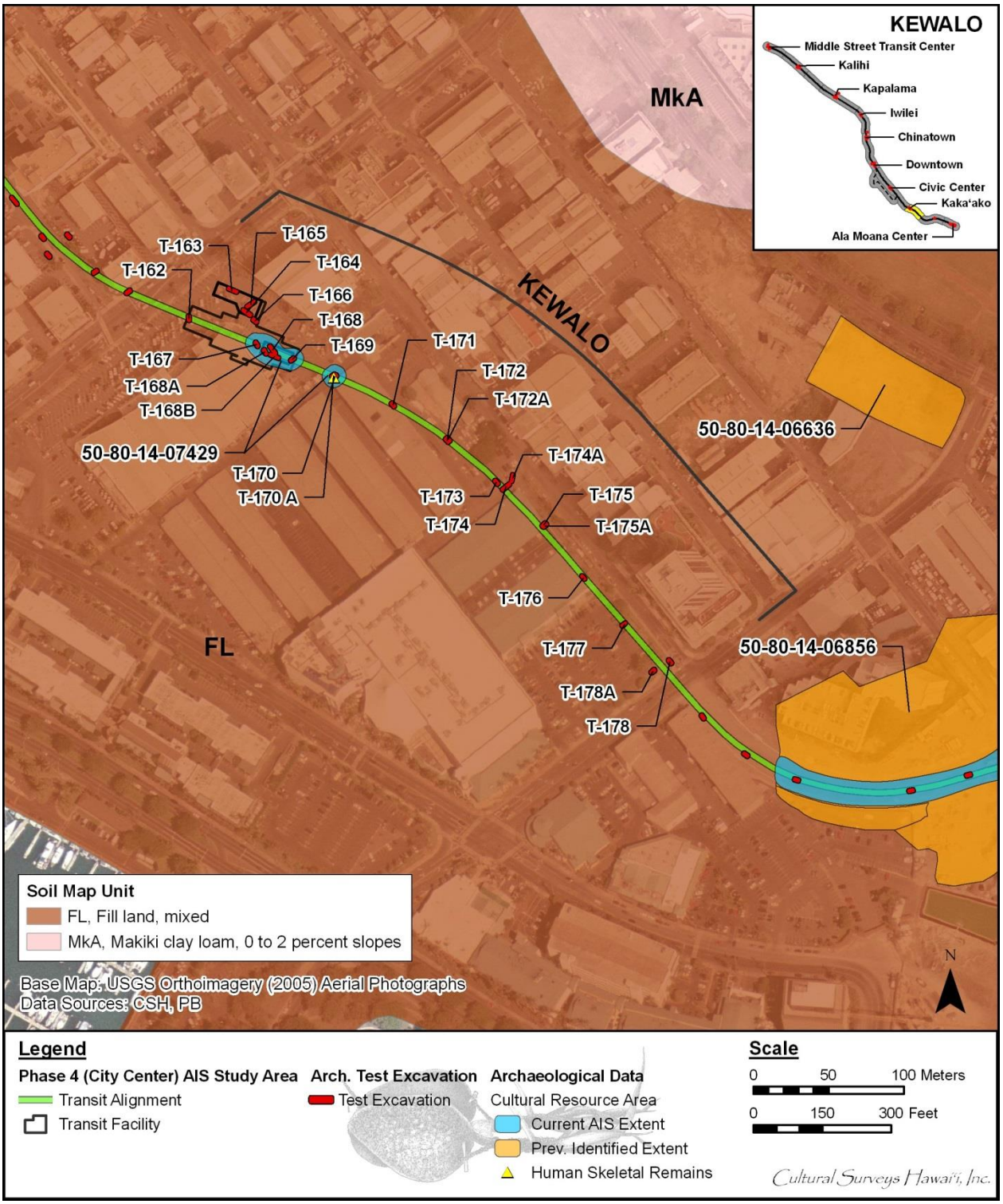


Figure 28. Aerial photograph (source: U.S. Geological Survey Orthoimagery 2005) with overlay of the Soil Survey of Hawai‘i (Foote et al. 1972) showing sediment types within and in the vicinity of the Kewalo Zone

> A fishpond and surrounding land on the plains below King Street, and beyond. It contains a spring rather famous in the times previous to the conversion to Christianity, as the place where victims designed for the Heiau of Kanelaau on Punchbowl slopes, was first drowned. The priest holding the victim's head under water would say to her or him on any signs of struggling, "Moe malie i ke kai o ko haku." "Lie still in the waters of your superiors." From this it was called Kawailumalumai, "Drowning waters" [Sterling & Summers 1978:292].

4.4.2 LCA Documentation

Among the first descriptions of the Kaka‘ako area (including Kewalo) by the Hawaiians themselves are the testimonies recorded during the 1840s in documents associated with LCA and awardees of the Māhele. The LCA records indicate that the traditional Hawaiian usage of the region and its environs may have been confined to salt making, farming of fishponds, and wetland agriculture (see Vol. III Appendix E). The testimonies indicate that the area was lived on and was shaped by Hawaiians prior to the nineteenth century. The LCA records also reveal that midway through the nineteenth century, taro cultivation, traditional salt making, and fishpond farming activities continued in this area. These activities and the land features that supported them would later be eliminated or buried during the remainder of the nineteenth century by the urbanization of Honolulu.

Three LCAs were awarded in the vicinity of the Kewalo Zone: 387, 10436:1, and 10605 (see Figure 27, Table 6, and Figure 29).

The *‘ili* of Kewalo was awarded to Kamake‘e Pi‘ikoi, wife of Jonah Pi‘ikoi, as part of LCA 10605, *‘āpana* 7. The award was shared between husband and wife (Kame‘eleihiwa 1992:269). Kewalo was a large 270.84-acre land section extending from Kawaiaha‘o Church to Sheridan Street. This land section had numerous large fishponds, which were awarded as part of the claim to Pi‘ikoi.

Table 6. LCAs in the Vicinity of the Kewalo Zone (in numerical order)

LCA Number	Contents of Award
387	To the American Board of Commissioners for Foreign Missions (ABCFM)
10436:1	One house lot, two ponds, and a salt land to Napela
10605	*‘Ili* of Kewalo, numerous large fishponds, to Kamake‘e Pi‘ikoi

4.4.3 Historic Land Use

From pre-Contact through post-Contact times, salt production was a major endeavor in the Kewalo area. Hawaiians used *pa‘akai* (salt) for a variety of purposes: to flavor food, to preserve fish by salting, for medicines, and for ceremonial purposes. In the next years after the first sightings of the Hawaiian Islands by Captain Cook in 1778, most visitors to the islands were British and American fur traders who stopped at Hawai‘i on their way to China. One reason for their visit was to buy or trade for salt, which was used to cure the seal and mammal pelts

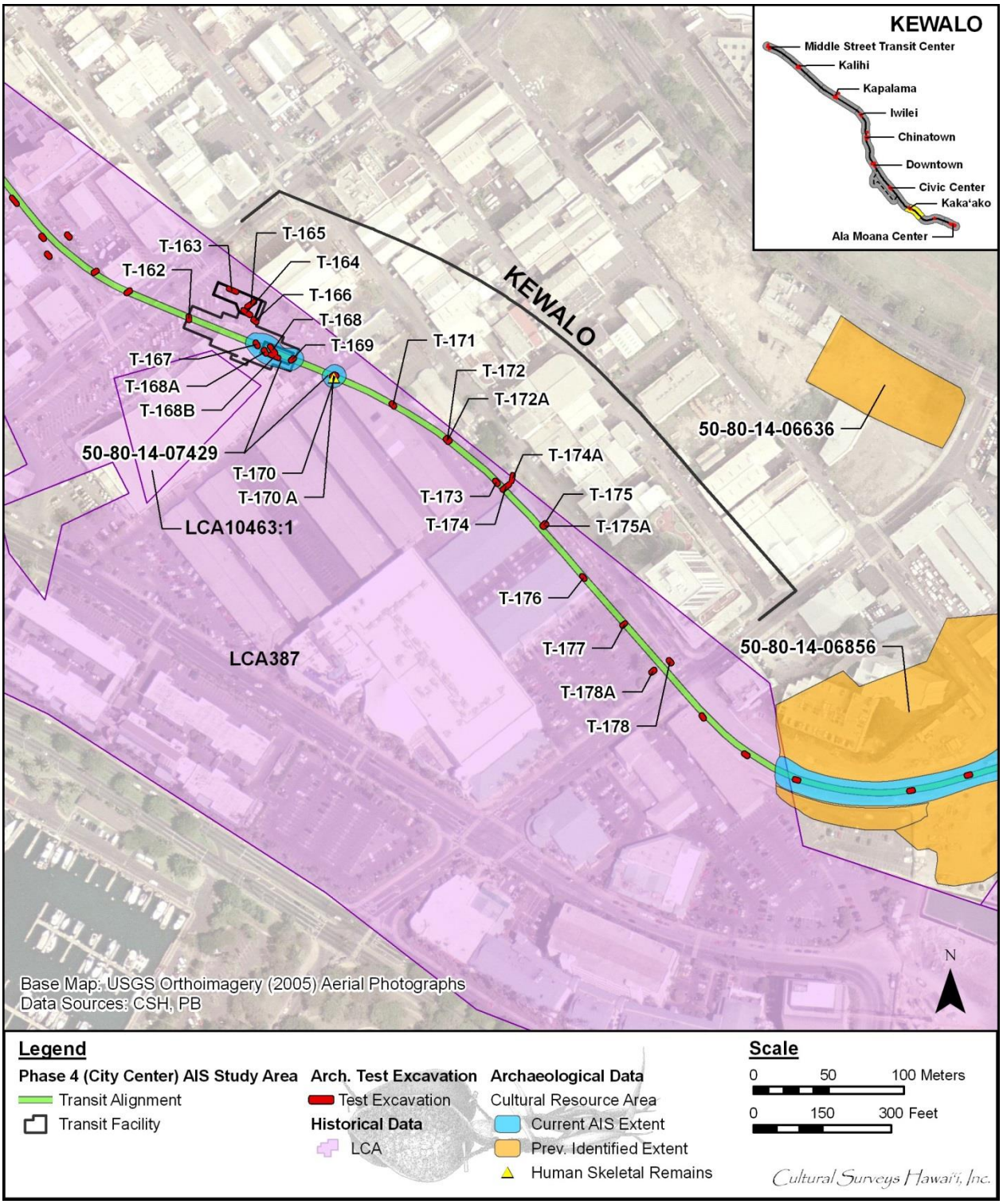


Figure 29. Aerial photograph (base map: U.S. Geological Survey Orthoimagery 2005), showing the locations of LCAs near the Kewalo Zone AIS test excavations along the transit corridor and at the Kaka‘ako Station

collected from the Northwest Coast. An 1883 map of the Honolulu Water Works System shows the extent of salt production within the Kewalo area (see Vol. II Figure 42). The area of salt pans is marked out as a large grid of contiguous squares located within the vicinity of the Kaka‘ako Station.

The export of salt declined in the late nineteenth century. Thrum (1924:116) states that the apex of the trade was in 1870, but by 1883 he noted that “pulu, salt and oil have disappeared entirely” from the list of yearly exports (Thrum 1884:68). By 1901, most of the fishponds and salt pans *makai* of King Street were reported as abandoned.

By the 1880s, infilling of the mud flats, marshes, and salt ponds in the Kewalo and greater Kaka‘ako area had begun. This work was performed for public health and sanitation reasons, for the construction of new roads and the improvement of older roads, and to provide more room for residential subdivisions, industrial areas, and tourist resorts. In 1910, after an epidemic of bubonic plague, the Board of Health condemned a large section of Kewalo (immediately northwest of the Kewalo Zone), consisting of 140 land parcels with numerous ponds (Hawai‘i Department of Public Works 1914:196).

Several reclamation projects (the Kewalo Reclamation Project and the Waikīkī Reclamation Project including the Ala Wai Canal and the Kewalo Basin Dredging Project) in the 1930s moved millions of tons of sediment. During the first half of the twentieth century, both rice fields and marshlands would be eliminated as land in Kewalo (as well as Kaka‘ako and Kālia) was filled to accommodate the expanding urbanization of Honolulu. The extensive fill activities of the 1930s allowed for the development of a grid of streets and urbanization in the 1940s.

An 1887 map by W. A. Wall shows very little development within the vicinity of the Kewalo Zone (see Vol. II Figure 47). But by 1897, the street grid system is encroaching from the northwest upon land in the vicinity of the Kewalo Zone, although the coastal region is still undeveloped (see Vol. II Figure 48). The 1914 Sanborn Series maps show some development *mauka* of the Kewalo Zone corridor (Figure 30). A 1919 U.S. Army War Department Fire Control map shows a proposed street grid system and several dwellings/structures (Figure 31). Development lagged throughout the 1920s, as much of the land in this area had not yet been filled in. The 1927 Sanborn Series maps show little new development, although two new businesses are shown at either end of the Kewalo Zone corridor, just *mauka*: J. L. Young Engineering Co. is shown at the southeast end of the zone, while the Hawaiian Mahogany Co., Ltd.’s Ukulele Factory is shown at the northwest end (Figure 32). A 1943 War Department map shows several large warehouses along the Kewalo Zone corridor (see Vol. II Figure 51). The 1950 Sanborn Series maps show further development at the northwest end of the Kewalo Zone (Figure 33). The Hawaiian Mahogany Co., Ltd. Ukulele Factory is now an expanded Hawaiian Furniture Manufacturing Co. and the T. Kakimoto Lumber Co. has been constructed *makai* of that, in the area of the Kaka‘ako HHCTCP Station.

4.4.4 Settlement Pattern Summary

The traditional Hawaiian settlement pattern appears to have been quite low density in the vicinity of the Kewalo Zone ostensibly because of the high water table and marshy ground. This coastal area, below the present-day King Street, consisted of extensive swamp lands utilized for fishponds and salt pans along with *occasional* taro *lo‘i* and habitation. The extent of salt cultivation may have significantly increased during the post-Contact period; however, the

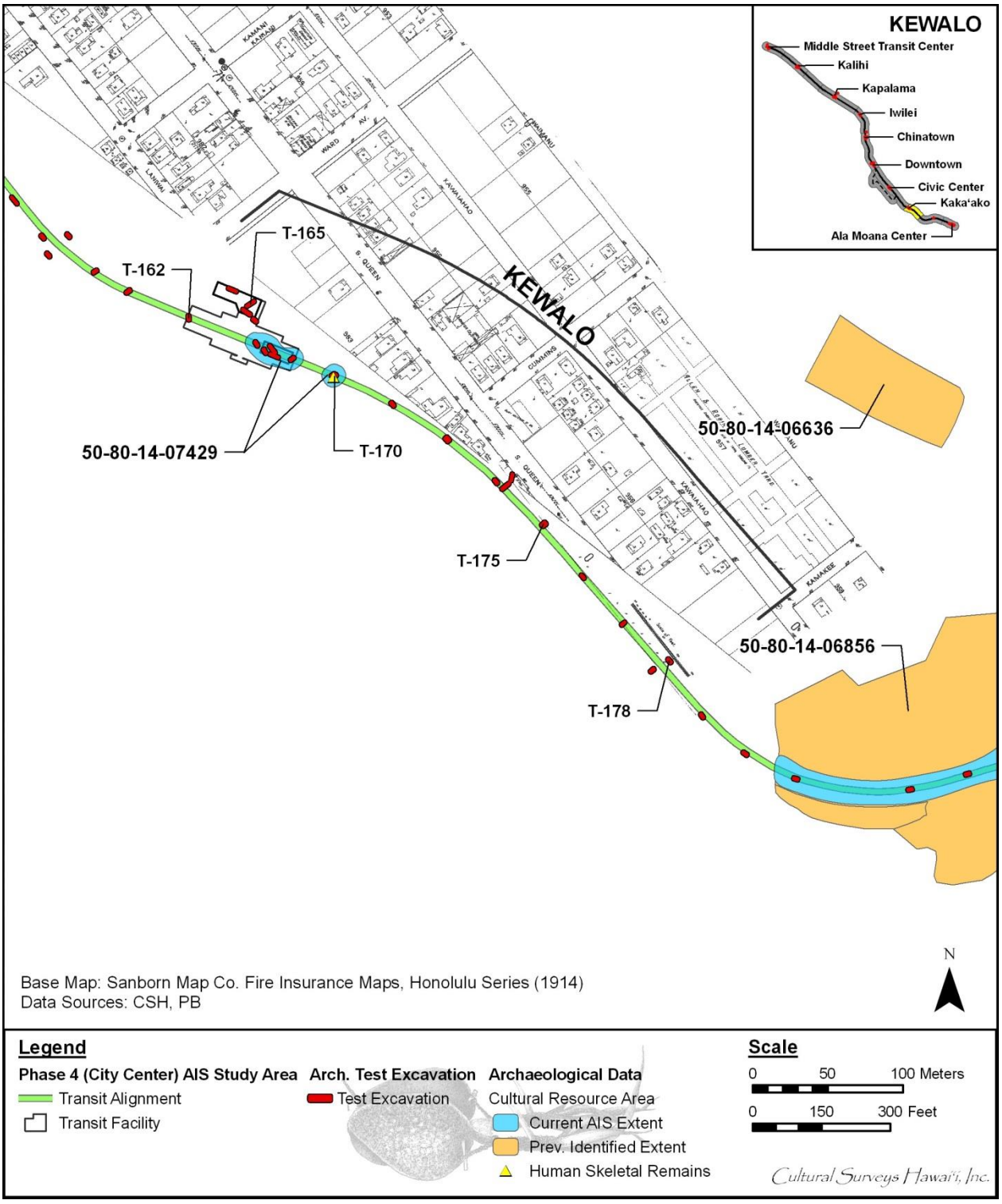


Figure 30. 1914 Sanborn Series map showing limited development along the transit corridor with test excavations in the Kewalo Zone

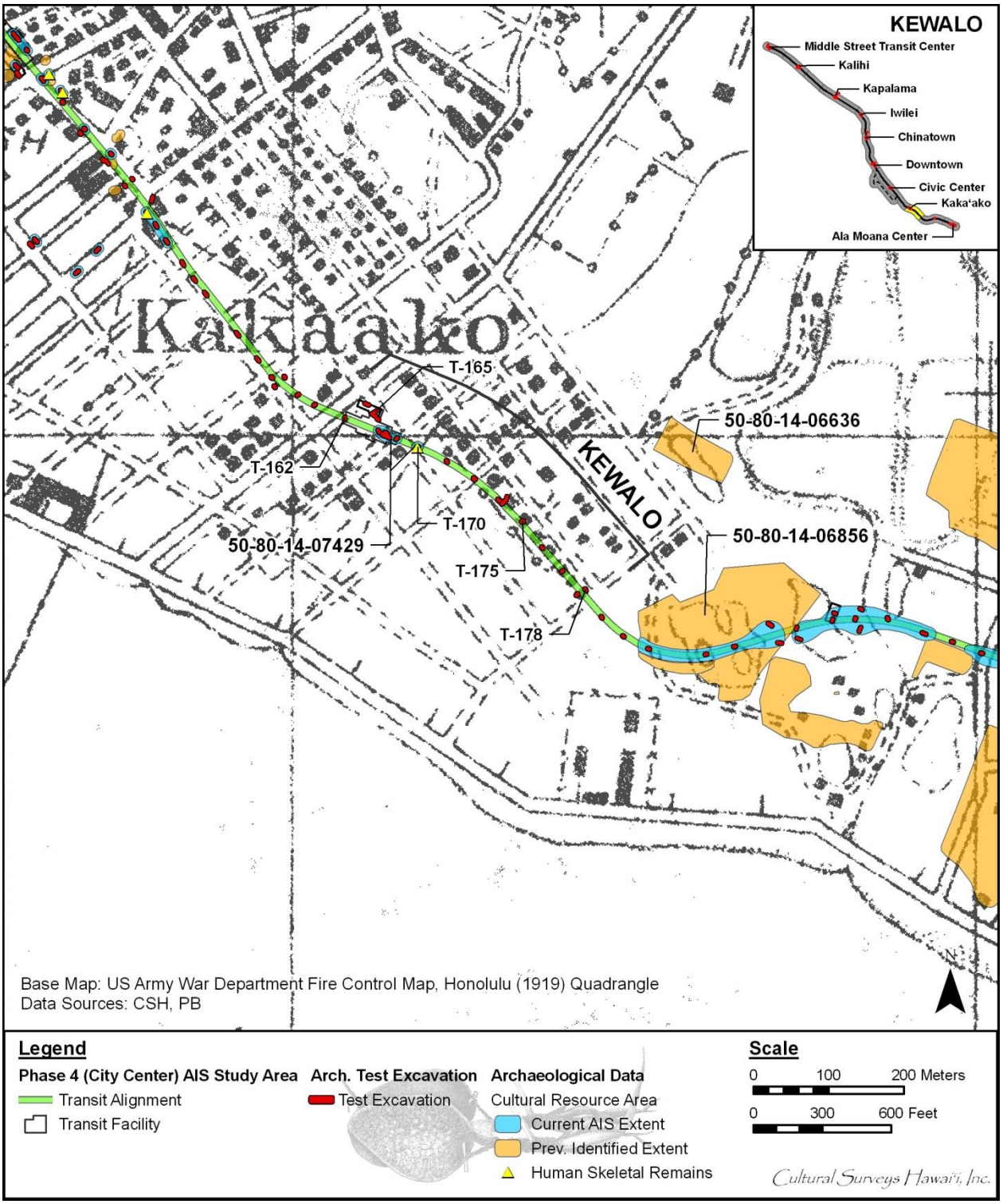


Figure 31. 1919 U.S. Army War Department Fire Control map, Honolulu Quadrangle, showing the transit corridor and AIS excavations in the Kewalo Zone; note the proposed street grid system

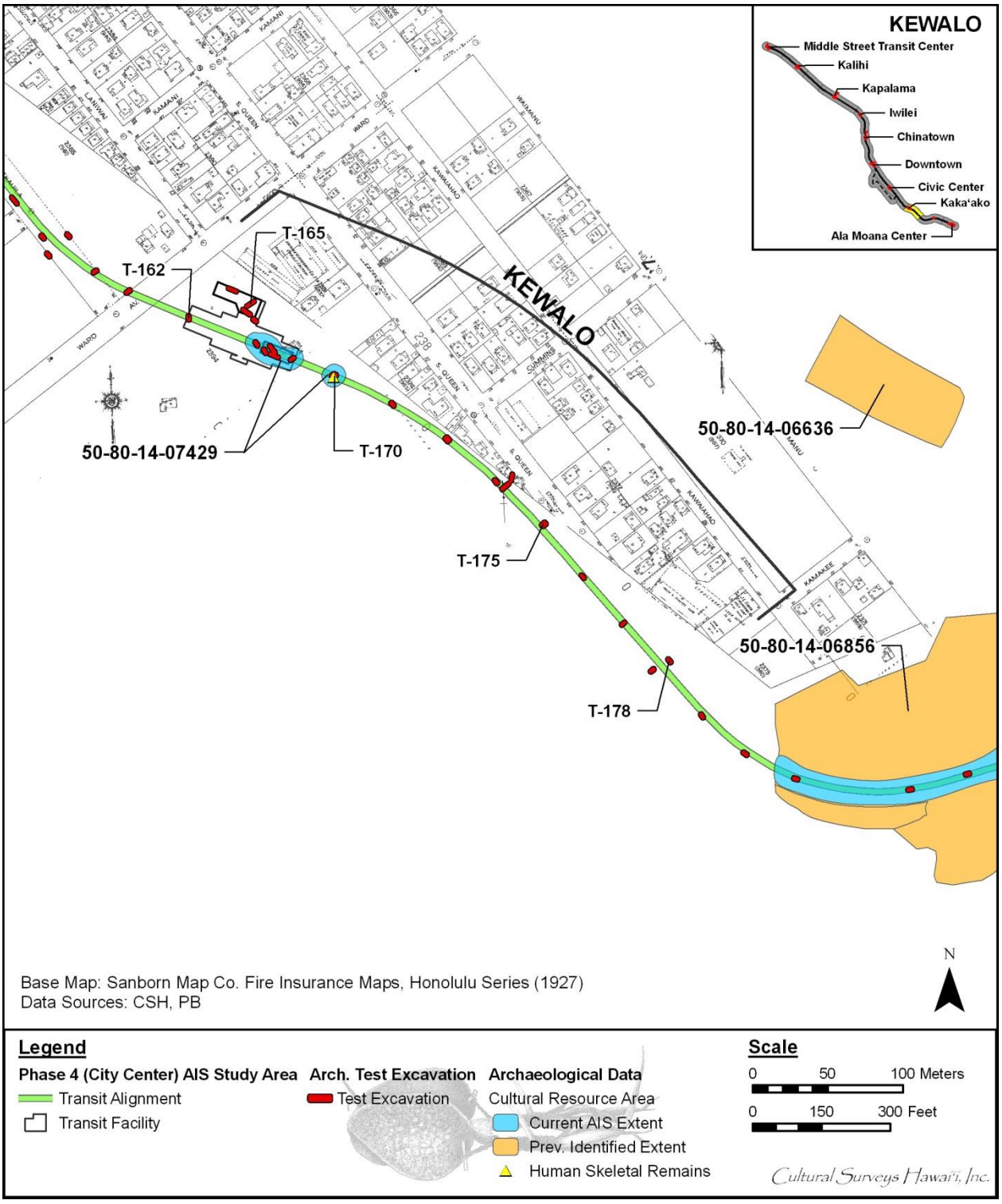


Figure 32. 1927 Sanborn Series map showing the transit corridor in the Kewalo Zone and limited development

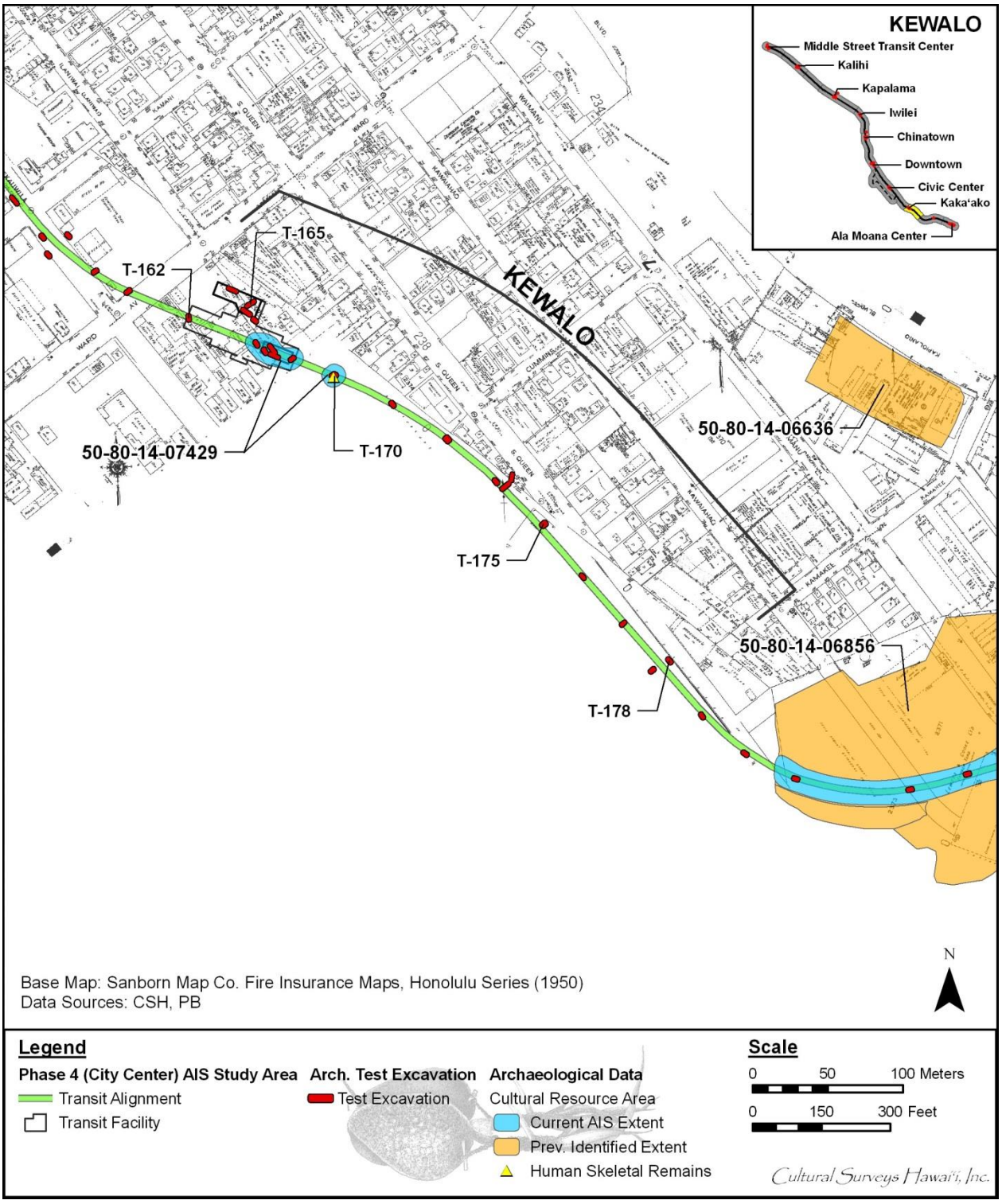


Figure 33. 1950 Sanborn Series map showing the transit corridor and test excavations in the Kewalo Zone, with encroaching development

importance of salt cultivation in the pre-Contact period was consistently described and mapped by early Western arrivals.

4.5 Previous Archaeology

Few archaeological studies have been conducted in Kapālama in the vicinity of the Kewalo Zone, and only five studies have been conducted directly adjacent to the Kewalo Zone (Figure 34). Table 7 lists and summarizes the five studies directly adjacent to the East Kapālama Zone and they are described in more detail below.

Table 7. Previous archaeological studies conducted adjacent to the Kewalo Zone (arranged chronologically)

Author	SIHP # 50-80-14	Report Description and Findings
Winieski and Hammatt 2000b	-5598	Archaeological monitoring report for the Kaka‘ako Improvement District 4 Project; two isolated historic coffin burials documented on Kamake‘e Street, between Kawaiaha‘o and Waimanu Streets.
Souza, Perzinski, and Hammatt 2002	-6376; -6377; and -6378	Archaeological monitoring report for the Kaka‘ako Improvement District 7 Project; three burials documented
Fong, Borthwick, and Hammatt 2009	N/A	Archaeological monitoring of Kapi‘olani Boulevard Drainage, Water, and Sewer Systems Improvements; no historic properties identified
Altizer et al. 2011	-6636	Archaeological monitoring report for the Kapi‘olani area revised sewer system; wetland deposit identified in Sewer Line G, near Kamaile Street, far from the present project area.
Yamauchi et al. 2011	N/A	Archaeological monitoring report for the Queen and Kamake‘e Traffic Signal Project; no historic properties identified

Queen and Kamake‘e Streets Intersection (Yamauchi et al. 2011)

The Yamauchi et al. (2011) study was an archaeological monitoring report for the Queen and Kamake‘e Streets intersection Traffic Signal Project. No historic properties were identified during the study.

Yamauchi et al. (2011) recorded four stratigraphic profiles (Profiles 1 through 4) in the immediate vicinity of the Kewalo Zone corridor, all within or near the intersection of Queen and Kamake‘e Streets. The stratigraphy observed at Profiles 1 through 3 included multiple fill layers overlying a previously disturbed or truncated sand A-horizon, followed by natural Jaucas sand

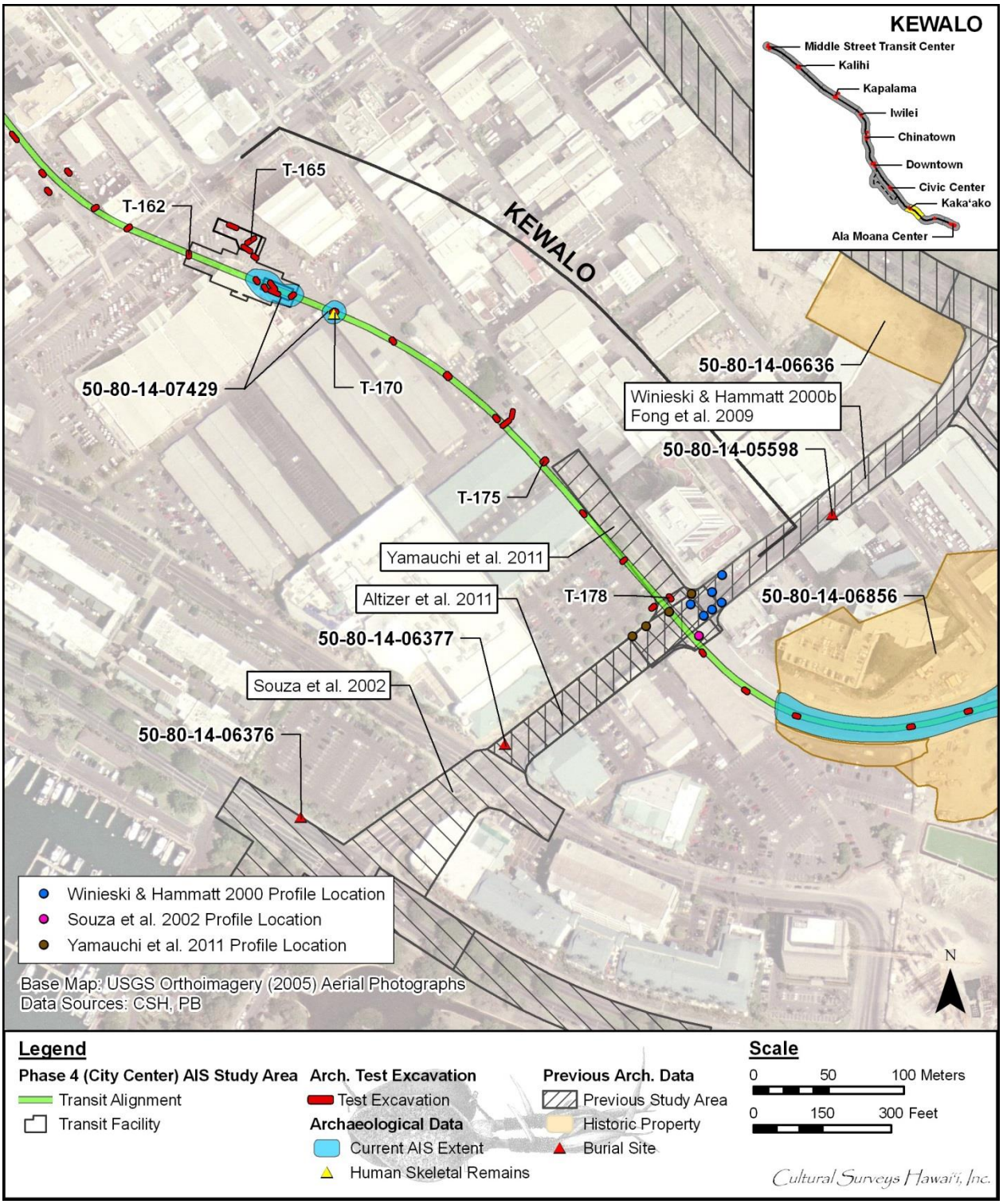


Figure 34. Previous archaeological studies in the vicinity of the Kewalo Zone (base map: U.S. Geological Survey Orthoimagery 2005)

and the coral shelf. The stratigraphy of Profile 4 was similar except that there was no A-horizon. Adjacent transit excavation T-178 and T-178A produced similar results. T-178 contained a former sand A-horizon, while T-178A did not.

Kaka‘ako Improvement District 7 (Souza, Perzinski, and Hammatt 2002)

The Souza, Perzinski, and Hammatt (2002) study was an archaeological monitoring program for the Kaka‘ako Improvement District 7 Project. During monitoring, three human burials were encountered; they were severely disturbed by excavation activity. Burial 1 (SIHP # 50-80-14-6376) and Burial 3 (SIHP # 50-80-14-6378) were discovered in base yard backdirt piles. Burial 1 had originally come from an electric box trench on Ala Moana Boulevard, near the Kamake‘e Street intersection. Burial 2 (SIHP # 50-80-14-6377) was discovered during backhoe excavations for a box drain located on Kamake‘e Street, between Auahi and Queen Streets, just *makai* of the Kewalo Zone corridor. The burial was within an undisturbed beach sand deposit. It was believed that the burials were traditional Hawaiian burials. One of the Souza et al. (2002) profiles (P10) was located in the vicinity of the Kewalo Zone corridor, although technically within the East Kaka‘ako Zone. P10 consisted of asphalt pavement and several fill layers overlying a former sand A-horizon, natural Jaucas sand, and sandy clay. This was similar to nearby test excavation T-178A, which also contained a sandy former A-horizon. No former A-horizons (or any natural sediments) were identified in other nearby transit excavations T-178A and T-179.

Kapi‘olani Area Revised Sewer System Project (Altizer, Borthwick, and Hammatt 2011)

The Altizer, Borthwick, and Hammatt (2011) study was an archaeological monitoring report for the Kapi‘olani Area Revised Sewer System and comprised multiple sewer line segments (Sewer Lines A through H and J through N). This study documented two layers of former wetland sediments, possibly pond sediments, identified as SIHP # -06636 in Sewer Line G, far from the Kewalo Zone corridor. The only sewer line segment located near the Kewalo Zone corridor was Sewer Line B, on Kamake‘e Street, just *makai* of the Kewalo Zone corridor. No historic properties were documented in Sewer Line B, and no stratigraphy was recorded either.

Rehabilitation of Streets, Unit 9, Phase 1 Project (Fong, Borthwick, and Hammatt 2009)

The Fong, Borthwick, and Hammatt (2009) study was an archaeological monitoring report for construction associated with the upgrading of existing drainage, water, and sewer systems within Kapi‘olani Boulevard, from Kalākaua Avenue to Ward Avenue; within Kamake‘e Street, from Kapi‘olani Boulevard to Auahi Street; and within Atkinson Drive, from Kapi‘olani Boulevard to Ala Moana Boulevard. No historic properties were identified during the study. Observed stratigraphy consisted primarily of imported fill material associated with utility and road construction. In some instances, pockets of naturally deposited sediment (Jaucas sand and wetland clays) were observed beneath fill deposits. No profiles were recorded near the Kewalo Zone corridor.

Kaka‘ako Improvement District 4 (Winieski and Hammatt 2000b)

The Winieski and Hammatt (2000b) study was an archaeological monitoring program for the Kaka‘ako Improvement District 4 Project. Winieski and Hammatt (2000b) documented two historic coffin burials (SIHP # 50-80-14-5598) on Kamake‘e Street, between the intersections of

Kawaiaha‘o and Waimanu Streets, one block *mauka* of the Kewalo Zone corridor. The two adjacent burials were0020within well-defined burial pits that originated within a former A-horizon that was capped by modern fill. The soil contained staining from the deteriorated coffin wood. No associated artifacts were discovered with the burials.

Winieski and Hammatt (2000b) recorded six profiles (P1-P6) in the immediate vicinity of the Kewalo Zone corridor, all within or near the intersection of Queen and Kamake‘e Streets. P1 consisted of a various fill layers overlying a natural layer of decomposing sandy clay mixed with coral rubble from the coral shelf. P2, P3, P4, and P5 contained fill overlying a former A-horizon, natural Jaucas sand, and in some cases a layer of decomposing sandy clay mixed with coral rubble from the coral shelf. P6 had been previously disturbed by an existing sewer line trench and contained disturbed fill layers associated with the sewer line overlying natural Jaucas sand. Unlike P1 through P6, an adjacent transit excavation, T-178, did not contain a former sand A-horizon or any natural sediment.

4.6 Modern Land Use and Built Environment

The Kewalo Zone traverses an urban environment through the neighborhood of Kaka‘ako/Kewalo. The Kewalo Zone corridor begins near the intersection of Halekauwila Street and Ward Avenue at the northwest end and cuts across current parking lots and commercial structures to get to and then follow along the *makai* side of Queen Street to Kamake‘e Street at the southeast end. Parcels bordering the Kewalo Zone corridor contain commercial buildings and warehouses and large parking lots. A massive utility corridor is also present throughout the Kewalo Zone containing electrical, gas, water, sewer, and storm lines. The number and distribution of these existing utilities indicate that this portion of the transit corridor has been heavily disturbed in the past.

4.7 Test Excavation 162 (T-162)

***Ahupua‘a*:**	Honolulu
LCA :	387
TMK #:	2-3-002:059
Elevation Above Sea Level:	1.88 m
UTM:	618768 mE, 2355419 mN
Max Length/Width/Depth:	3 m / 0.9 m / 1.89 m
Orientation:	346 / 166° TN
Targeted Project Component:	Station Column
USDA Soil Survey Soil	Fill land (FL)

Setting: Test Excavation 162 (T-162) was located within the level parking lot area paralleling Ward Avenue. T-162 was relocated approximately 18.5 m east of its original layout so that it would be within the station column footprint. T-162 was on privately owned property. No utilities were located within proximity of T-162.

Summary of Background Research and Land Use: Land Court Application 670 map 1 indicates that T-162 was originally situated on a large parcel of land awarded to the American Board of Commissioners for Foreign Missions (ABCFM) as part of LCA 387. The LCA testimonies indicated taro cultivation, fishpond farming, and salt production in the region. The 1884 Bishop map of Honolulu to Kewalo indicates that T-162 was located within marsh land called Kukuluaeo, 22.0 m north of LCA 10463:1, awarded to Napela. An unimproved or planned roadway is also depicted, extending northeast (*mauka*) to southwest (*makai*) within 90.0 m of T-162. The roadway is also depicted on the 1887 Wall map of Honolulu along with three structures in the vicinity of T-162. The structures were located approximately 40.0 m northwest, 65.0 m southeast, and 160.0 m southwest of T-162. The 1897 Monsarrat map of Honolulu depicts infrastructure development immediately north of T-162 including a near-modern street grid with the closest intersection being Ilaniwai Street and Kamani Street 115.0 m northwest and the Cyclomere bicycle track 300.0 m north. Expanded urbanization in the vicinity of T-162 is depicted throughout the series of twentieth century topographic maps and Sanborn fire insurance maps.

Few archaeological studies were conducted in the immediate vicinity of T-162. In 2000, CSH conducted archaeological monitoring for Ward Village Phase II (Ward Theaters), approximately 220.0 m southeast of T-162. A buried A-horizon and naturally-deposited pond sediments were documented in portions of the project area but, no cultural resources were assigned (Winieski and Hammatt 2001). In 2005, CSH conducted an archaeological inventory survey for the Moana Vista Project on Kapi‘olani Boulevard, located approximately 350.0 m east of T-162. No cultural resources were encountered (O’Leary and Hammatt 2006).

Documentation Limitations: T-162 was excavated to the coral shelf at 1.89 mbs and beneath the water table at 1.85 mbs. A utility pipe located in the northern portion of T-162 limited excavation.

Stratigraphic Summary: The stratigraphy of T-162 was consisted of fill overlying natural sediment. Observed strata included asphalt (Ia), very gravelly sandy clay (Ib), clay loam (Ic), silty clay loam (Id), sandy clay fill (Ie), natural sandy clay loam (II), and gravelly sandy loam (III). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were collected individually during excavation.

Sample Results: A total of two bulk sediment samples were collected within T-162, from Stratum II between 1.38 mbs and 1.55 mbs and from Stratum III between 1.55 mbs and 1.89 mbs. The sediment samples were collected from the excavation floor and were not depicted in the stratigraphic profile. Both sediment samples were wet-screened. A bulk sediment sample was collected from Stratum II between 1.38 mbs and 1.55 mbs and contained naturally-occurring marine shell (0.3 g). A bulk sediment sample was collected from Stratum III between 1.55 mbs and 1.89 mbs and contained naturally-occuring marine shell (0.4 g). The results of sample analysis documented the presence of naturally-occuring marine shell within Stratum II and III.

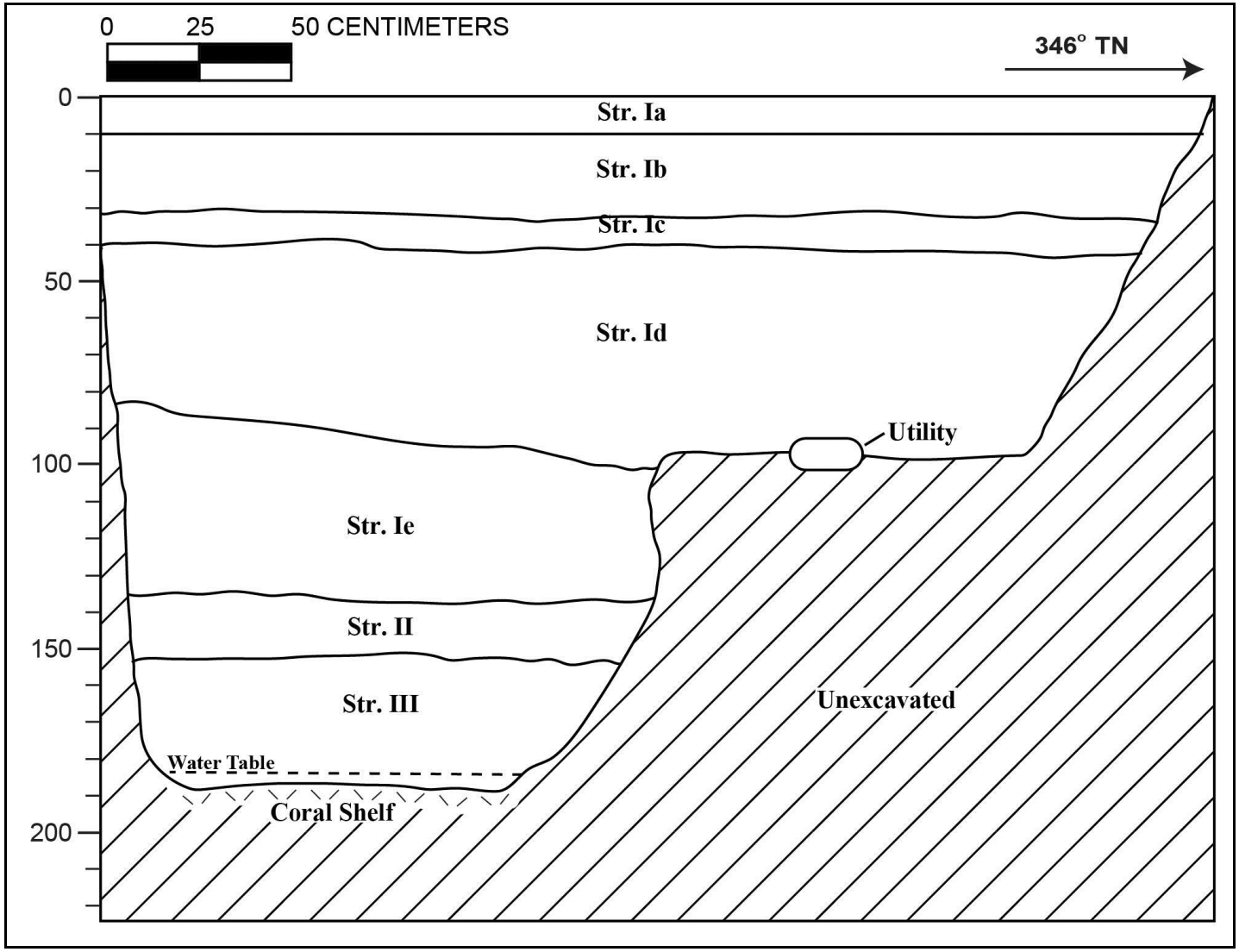
GPR Discussion: A review of amplitude slice maps indicated no linear features which might indicate the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.25 mbs.

GPR depth profiles for T-162 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.2 mbs. An anomaly was observed in the profile that could correspond to the utility encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

Summary: T-162 was excavated to the coral shelf at 1.89 mbs and beneath the water table at 1.85 mbs. The stratigraphy of T-162 was consisted of fill (Ia-Ie) overlying natural sediment (II-III). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). A total of two bulk sediment samples were collected within T-162, from Stratum II between 1.38 mbs and 1.55 mbs and from Stratum III between 1.55 mbs and 1.89 mbs. The results of sample analysis documented the presence of naturally-occuring marine shell within Stratum II and III. No cultural resources were identified within T-162.

T-162 general location (view to south).

T-162 west wall profile (view to southwest)



T-162 west wall profile.

T-162 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-10	Asphalt
Ib	10-33	Fill; 10 YR 8/2 (very pale brown); very gravelly sandy clay loam; massive, moderate, medium blocky structure; moist, friable, strong consistency; slightly plastic; mixed origin; abrupt, smooth lower boundary; crushed coral fill
Ic	33-43	Fill; 5 YR 4/3 (reddish brown); clay loam; weak, fine, blocky structure; moist, friable, weak consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; contains (1) rusted nail; clay loam
Id	41-101	Fill; 7.5 YR 3/3 (dark brown); silty clay loam; weak, fine, crumb structure; moist, very friable, consistency; slightly plastic; terrigenous origin; clear, smooth lower boundary
Ie	85-138	Fill; 10 YR 8/2 (very pale brown) with common mottles 10 YR 7/1 (light gray); sandy clay; weak, very fine, platy structure; moist, very friable, weak consistency; slightly plastic; mixed origin; abrupt, smooth lower boundary; hydraulic fill sandy clay
II	138-155	Natural; 5 Y 5/1 (gray); gravelly sandy clay loam; weak, coarse, crumb structure; moist, very friable, weak consistency; slightly plastic; mixed origin; diffuse, smooth lower boundary; common, fine roots; buried A-horizon
III	155-189	Natural; 2.5 Y 6/1 (gray); gravelly sandy loam; structureless, single-grain; weak, very coarse, granular structure; wet, non-sticky, weak consistency; non-plastic; mixed origin; lower boundary not visible; micro mollusk shell fragments, decomposing coral shelf

4.8 Test Excavation 163 (T-163)

***Ahupua‘a*:**	Honolulu
LCA :	387
TMK #:	2-3-002:059
Elevation Above Sea Level:	1.93 m
UTM:	618797 mE, 2355438 mN
Max Length/Width/Depth:	6.73 m, 0.76 m, 1.9 m
Orientation:	290 / 110° TN
Targeted Project Component:	Station Building
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 163 (T-163) was located approximately 30.0 m southeast of Ward Avenue and Ilaniwai Street intersection, and was located within a parking lot. T-164 was located on private property owned by Victoria Ward Ltd. No utilities were located within close proximity of T-164. The excavation surface was level with the surrounding land surface.

Summary of Background Research and Land Use: Land Court Application 670 map 1 indicates that T-163 was originally situated on a large parcel of land awarded to the American Board of Commissioners for Foreign Missions (ABCFM) as part of LCA 387. The LCA testimonies indicated taro cultivation, fishpond farming, and salt production in the region. The 1884 Bishop map of Honolulu to Kewalo indicates that T-163 was located within marsh land called Kukuluaeo, 52.0 m north of LCA 10463:1, awarded to Napela. An unimproved or planned roadway is also depicted, extending northeast (*mauka*) to southwest (*makai*) within 80.0 m of T-163. The roadway is also depicted on the 1887 Wall map of Honolulu along with three structures in the vicinity of T-163. The structures were located approximately 55.0 m northwest, 80.0 m south, and 195.0 m southwest of T-163. The 1897 Monsarrat map of Honolulu depicts infrastructure development immediately north of T-163 including a near-modern street grid with the closest intersection being Ilaniwai Street and Kamani Street 115.0 m northwest and the Cyclomere bicycle track 265.0 m north. Expanded urbanization in the vicinity of T-163 is depicted throughout the series of twentieth century topographic maps and Sanborn fire insurance maps.

Few archaeological studies were conducted in the immediate vicinity of T-163. In 2000, CSH conducted archaeological monitoring for Ward Village Phase II (Ward Theaters), approximately 220.0 m southeast of T-163. A buried A-horizon and naturally-deposited pond sediments were documented in portions of the project area but, no cultural resources were assigned (Winieski and Hammatt 2001). In 2005, CSH conducted an archaeological inventory survey for the Moana Vista Project on Kapi‘olani Boulevard, located approximately 280.0 m east of T-163. No cultural resources were encountered (O’Leary and Hammatt 2006).

Documentation Limitations: T-163 was excavated to a depth of 1.9 mbs and beneath the water table at 1.84 mbs. There were no limitations to excavation documentation.

Stratigraphic Summary: The stratigraphy of T-163 consisted of fill strata overlying natural sediment to the base of excavation. Observed strata included asphalt (Ia), extremely gravelly sand (Ib), gravelly sandy loam (Ic), gravelly silty loam (Id), very gravelly sandy loam (Ie), gravelly silty sand (If), gravelly silty sand (Ig), gravelly coarse sand (Ih), fine sandy clay (Ii), clay fill (Ij), natural silty clay (II), sandy silty clay (III), and very coarse sand (IV). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

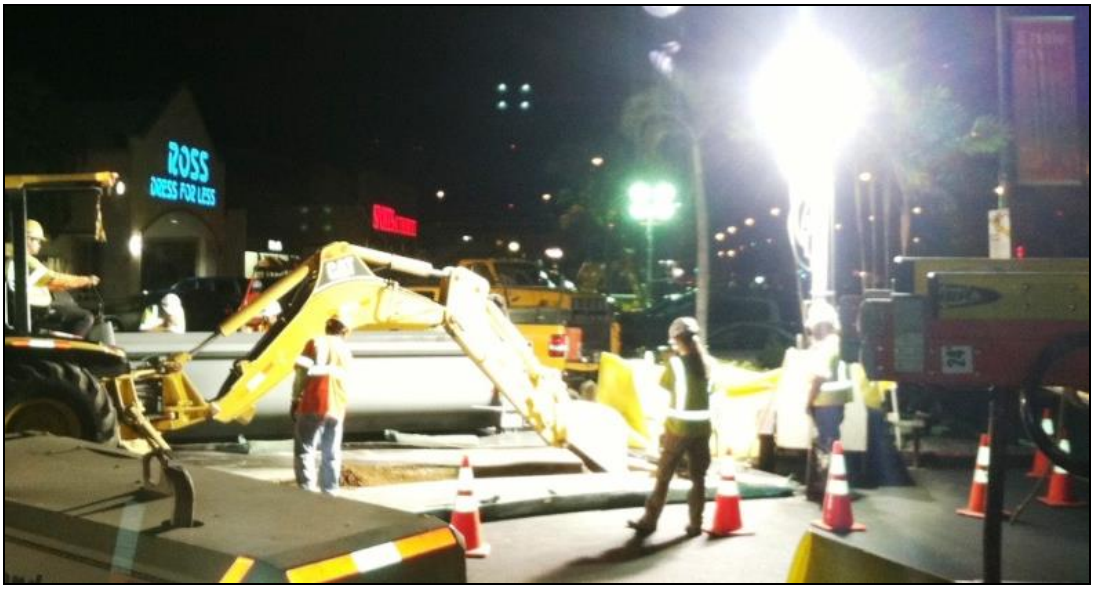
Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were collected individually during excavation.

Sample Results: A total of three bulk sediment samples were collected from within T-163 including one sample from Stratum IIa between 1.64mbs, Stratum IIb between 1.70 mbs, and Stratum IIc between 1.81 mbs. All of the bulk samples were wet-screened. The bulk samples collected from Stratum IIa contained naturally-occurring marine shell (0.1g) and organic material (0.1g). The bulk samples collected from Stratum IIb contained organic material (0.1g). The bulk samples collected from Stratum IIc contained naturally-occurring marine shell (3.2g). The results of the analysis of bulk sediment samples documented the presence of only naturally-occurring shell and organic material within all samples.

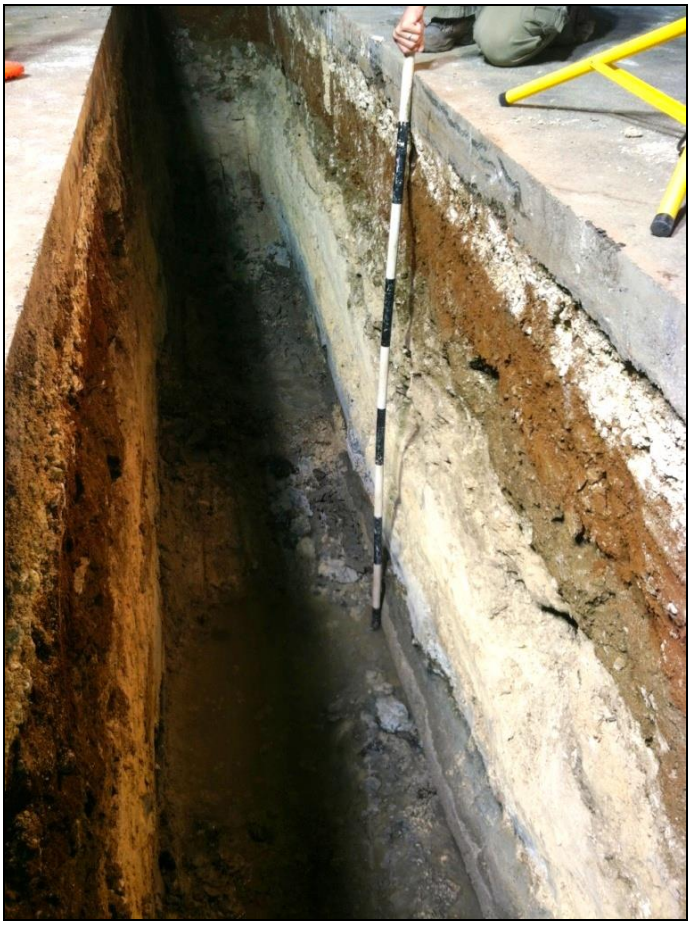
GPR Discussion: A review of amplitude slice maps indicated no linear features which might indicate the presence of utilities. Reflectivity was relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.5 mbs.

GPR depth profiles for T-163 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.35 mbs. No utilities were observed in the profile. The maximum depth of clean signal return was approximately 0.9 mbs.

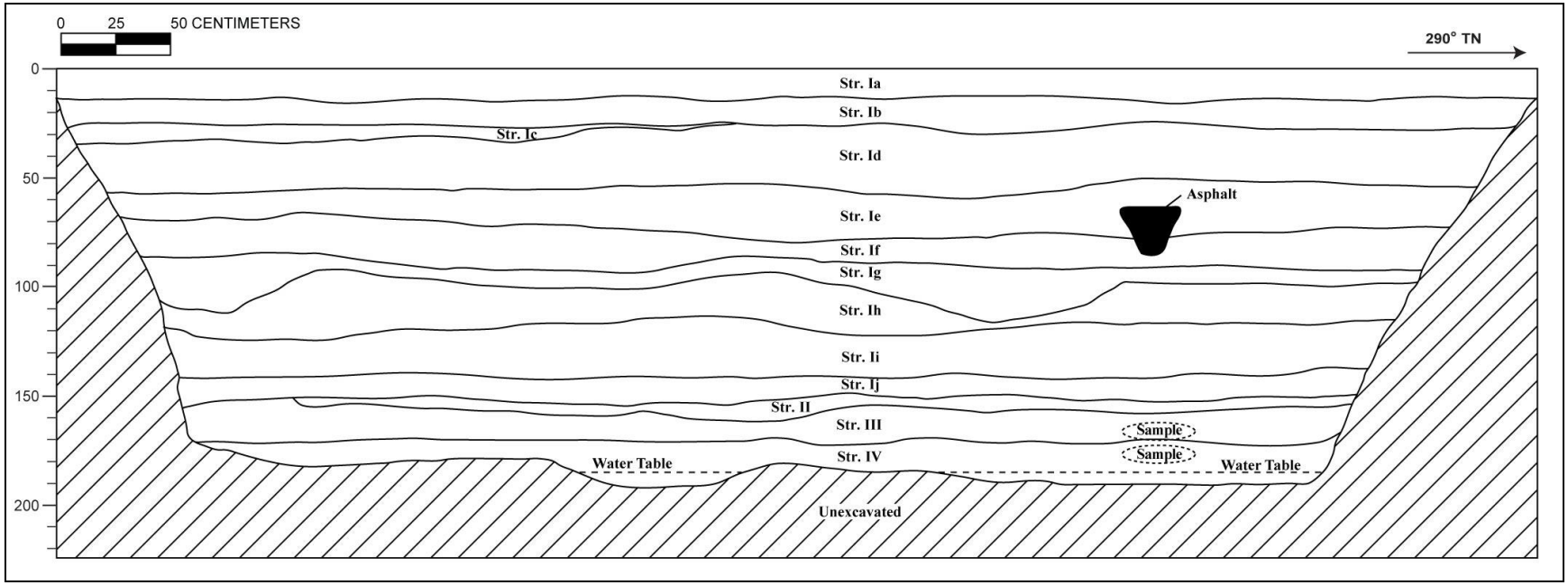
Summary: T-163 was excavated to a depth of 1.9 mbs. The stratigraphy of T-163 consisted of fill strata overlying natural sediment to the base of excavation. The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). A total of three bulk sediment samples were collected from within T-163 including one sample from Stratum IIa between 1.64mbs, Stratum IIb between 1.70 mbs, and Stratum IIc between 1.81 mbs. The results of the analysis of bulk sediment samples documented the presence of only naturally-occurring shell and organic material within all samples. No cultural resources were identified within T-163.



T-163 general location (view to south).



T-163 south wall profile (view to east).



T-163 south wall profile.

T-163 Stratigraphic Description

Stratum	Depth (cmbs)	Description
Ia	0-14	Asphalt
Ib	14-28	Fill; 10 YR 8/2 (very pale brown); extremely gravelly sand; structureless, single-grain; moist, very friable consistency; non-plastic; marine origin; abrupt, smooth lower boundary; crushed coral base course
Ic	28-34	Fill; 10 YR 3/2 (very dark grayish brown); gravelly sandy loam; weak, fine, crumb structure; moist, friable consistency; non-plastic; terrigenous origin; abrupt, smooth lower boundary; few, very fine roots
Id	25-58	Fill; 2.5 YR 2.5/3 (dark reddish brown); gravelly silty loam; weak, fine, blocky structure; moist; friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary
Ie	50-80	Fill; 10 YR 5/2 (grayish brown); very gravelly sandy loam; weak, fine, crumb structure; moist, friable consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; contained glass fragments and asphalt
If	68-93	Fill; 10 YR 7/3 (very pale brown); gravelly silty sand; structureless, single-grain; moist very friable, non-sticky consistency; non-plastic; mixed origin; clear smooth lower boundary; contained asphalt (also in Stratum Ie)
Ig	93-115	Fill; 10 YR 7/1 (light gray); gravelly silty sand; structureless, single-grain; moist, loose consistency; non-plastic; mixed origin, abrupt smooth, lower boundary
Ih	93-125	Fill; 10 YR 8/2 (very pale brown); gravelly coarse sand; structureless, single-grain; moist, loose, non-sticky consistency; non-plastic, clear, smooth lower boundary; fill sand
Ii	115-140	Fill; 10 YR 8/4 (very pale brown); fine sandy clay; structureless, single-grain; moist, loose, non-sticky consistency; non-plastic; marine origin; abrupt, smooth lower boundary; fill sand
Ij	140-155	Fill; GLEY 1 7/5GY (light greenish gray); clay; massive structure; moist, friable consistency. Plastic, mixed origin, abrupt, smooth lower boundary; hydraulic fill
II	150-160	Natural; 10 YR 3/2 (very dark grayish brown); silty clay; weak, fine, blocky structure; moist friable consistency; slightly plastic; marine origin; clear, smooth lower boundary; organically enriched peaty layer
III	150-170	Natural; GLEY 1 5/1 (greenish gray); sandy silty clay; weak, fine, blocky structure; moist, firm consistency; slightly plastic; marine origin; clear, smooth lower boundary; many, very fine roots
IV	170-190	Natural; 10 YR 6/2 (light brownish gray); very coarse sand; structureless, single-grain; wet, non-sticky consistency; non-plastic; lower boundary not visible

4.9 Test Excavation 164 (T-164)

***Ahupua‘a*:**	Honolulu
LCA :	387
TMK #:	2-3-002:059
Elevation Above Sea Level:	2.04 m
UTM:	618806 mE, 2355423 mN
Max Length/Width/Depth:	6.72 m, 0.76 m, 2.25 m
Orientation:	298 / 188° TN
Targeted Project Component:	Station Building
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 164 (T-164) was located approximately 47.0 m southeast of Ward Avenue and Ilaniwai Street intersection, and was located within a parking lot. T-164 was located on private property owned by Victoria Ward Ltd. No utilities were located within close proximity of T-164. The excavation surface was level with the surrounding land surface.

Summary of Background Research and Land Use: Land Court Application 670 map 1 indicates that T-164 was originally situated on a large parcel of land awarded to the American Board of Commissioners for Foreign Missions (ABCFM) as part of LCA 387. The LCA testimonies indicated taro cultivation, fishpond farming, and salt production in the region. The 1884 Bishop map of Honolulu to Kewalo indicates that T-164 was located within marsh land called Kukuluaeo, 33.0 m north of LCA 10463:1, awarded to Napela. An unimproved or planned roadway is also depicted, extending northeast (*mauka*) to southwest (*makai*) within 67.0 m of T-164. The roadway is also depicted on the 1887 Wall map of Honolulu along with three structures in the vicinity of T-164. The structures were located approximately 61.0 m northwest, 65.0 m south, and 180.0 m southwest of T-164. The 1897 Monsarrat map of Honolulu depicts infrastructure development immediately north of T-164 including a near-modern street grid with the closest intersection being Ilaniwai Street and Kamani Street 122.0 m northwest and the Cyclomere bicycle track 280.0 m north. Expanded urbanization in the vicinity of T-164 is depicted throughout the series of twentieth century topographic maps and Sanborn fire insurance maps.

Few archaeological studies were conducted in the immediate vicinity of T-164. In 2000, CSH conducted archaeological monitoring for Ward Village Phase II (Ward Theaters), approximately 200.0 m southeast of T-164. A buried A-horizon and naturally-deposited pond sediments were documented in portions of the project area but, no cultural resources were assigned (Winieski and Hammatt 2001). In 2005, CSH conducted an archaeological inventory survey for the Moana Vista Project on Kapi‘olani Boulevard, located approximately 280.0 m east of T-164. No cultural resources were encountered (O’Leary and Hammatt 2006).

Documentation Limitations: T-164 was excavated to a depth of 2.25 mbs and beneath the water table at 2.10 mbs. A utility pipe near located in the central portion of theT-164 limited documentation.

Stratigraphic Summary: The stratigraphy of T-164 consisted of fill overlying natural sediment to beneath the water table. Observed strata included asphalt (Ia), extremely gravelly sand fill (Ib), gravely silty sand fill (Ic), silty clay loam fill (Id), gravelly loam fill (Ie), gravelly sandy clay fill (If), and clay fill (Ig) overlying natural sandy clay (II) and coarse sand (III). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL).

Artifacts Discussion: A total of three artifacts (Acc. # 164-A-1 to A-3, see following table and photograph) were collected, one from Stratum Ic at 0.2-0.35 mbs, and two from Stratum Ie at 0.48-1.06 mbs. The artifact in Stratum Ic was a rail spike, possibly from the Honolulu streetcar tracks dating from 1898 to 1933 (Simpson and Brizdle 2000:43, 124) or from the O.R & L Railroad, which had a terminus train station in Iwilei to the west. The artifacts in Stratum Ie included a piece of milled wood and the base of a glass bottle that lacked mold seams, so it probably dates before 1920. The artifact collected from Stratum Ic indicates that the stratum dates to the early twentieth century, and predates Stratum Ie artifacts, one of which dates before 1920.

Features Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were individually collected during excavation.

Sample Results: A total of two bulk sediment samples were collected from Stratum II at 1.73-1.83 mbs and from Stratum III at 1.92-1.98 mbs. Both of the bulk samples were wet-screened. The bulk sample collected from Stratum II contained bruned crustacean (0.1 g), and *Ruppia maritima* seeds (0.1 g). The bulk sample collected form Stratum III contained crustacean (0.7 g), Echinodermata mathaei sp. (0.1 g), unidentified shell fragments (4.4 g), and a piece of plastic (0.1 g).

The results of sample analysis documented sparse amounts of marine shell within both Stratum II and III. The plastic will Stratum III may indicate modern disturbance to the stratum or may have been introduced during the excavation and sampling process.

GPR Discussion: A review of amplitude slice maps indicated no linear features although a utility was encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.5 mbs.

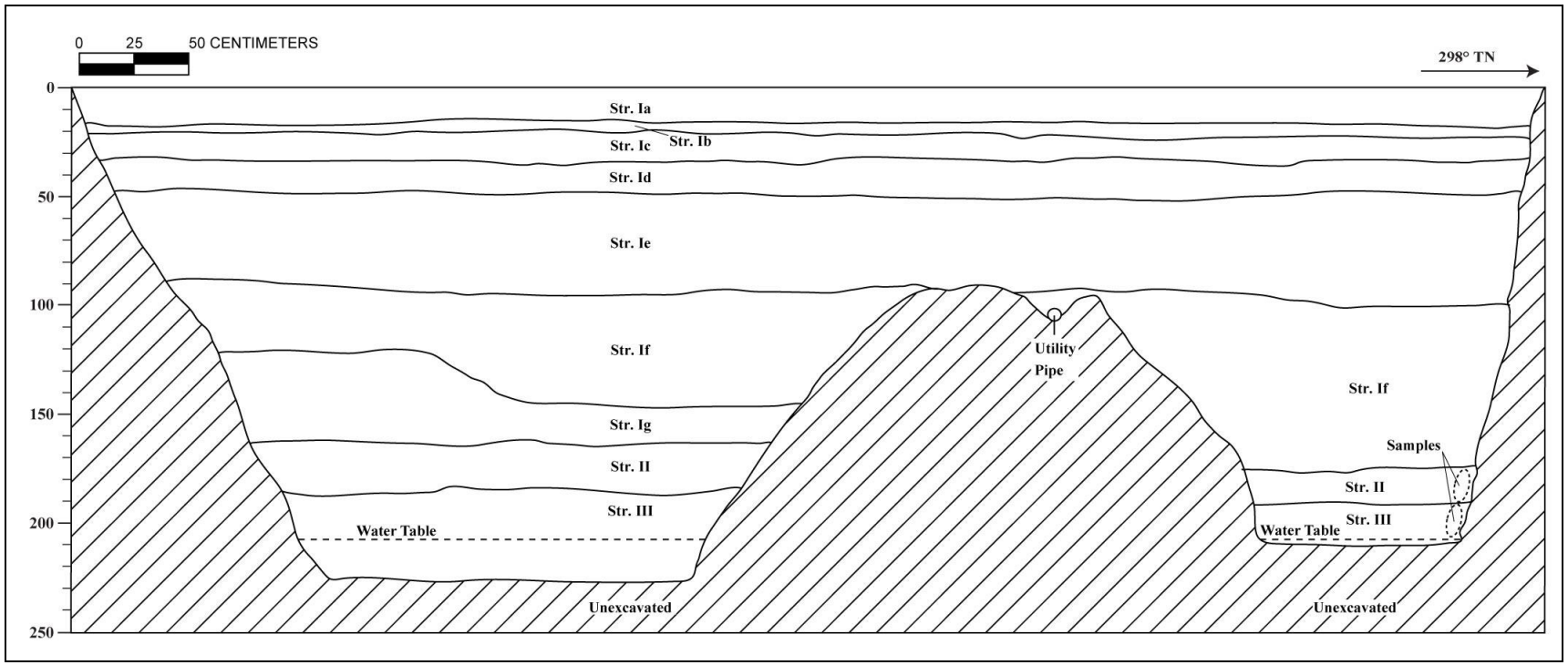
GPR depth profiles for T-164 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.25 mbs. No utilities were observed in the profile although a utility was encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

Summary: T-164 was excavated to the water table at a depth of 2.25 mbs. The stratigraphy of T-164 consisted of fill (Ia-Ig) overlying natural sediment (II-III). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). A total of three artifacts (Acc. # 164-A-1 to A-3) were collected, one from Stratum Ic at 0.2-0.35 mbs, and two from Stratum Ie at 0.48-1.06 mbs. The artifacts in Stratum Ie included a milled wood portion and the base of a glass bottle that lacked mold seams, so it probably dates before 1920. The artifact collected from

Stratum Ic indicates that the stratum dates to the early twentieth century, and predates Stratum Ie artifacts, one of which dates before 1920. A total of two bulk sediment samples were collected from Stratum II at 1.73-1.83 mbs and from Stratum III at 1.92-1.98 mbs. The results of sample analysis documented sparse amounts of marine shell within both Stratum II and III. The plastic will Stratum III may indicate modern disturbance to the stratum or may have been introduced during the excavation and sampling process. No cultural resources were identified within T-164.

T-164 general location (view to south).

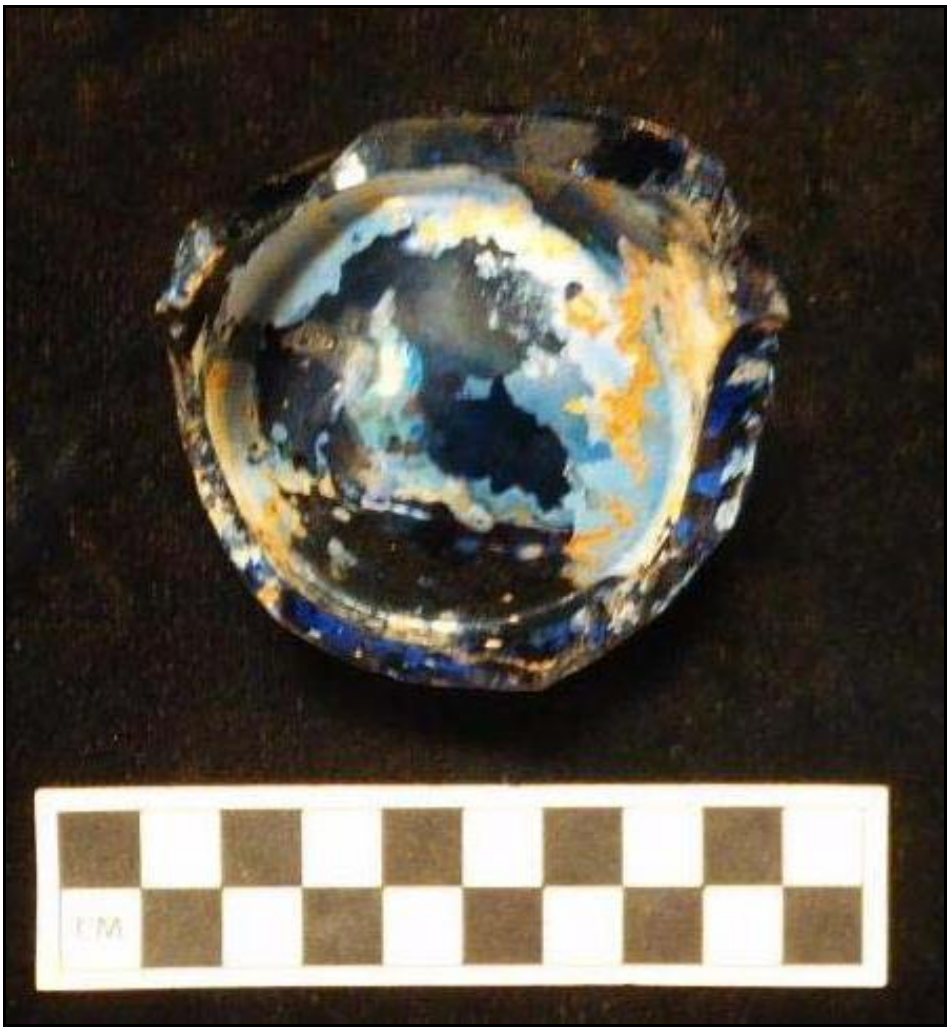
T-164 southwest wall profile (view to west).



T-164 southwest wall profile.

T-164 Stratigraphic Description of southwest wall.

Stratum	Depth (cmbs)	Description
Ia	0-16	Asphalt
Ib	16-22	Fill; 10 YR 7/3 (very pale brown); extremely gravelly sand; structureless, single-grain; dry, loose consistency; non-plastic; marine origin; very abrupt, smoother lower boundary; crushed coral base course (coral gravel)
Ic	20-35	Fill; 10 YR 3/3 (dark brown); gravelly silty sand; weak, fine, crumb structure; moist, very friable consistency; non-plastic; terrigenous origin; clear, smooth lower boundary; contained railroad spike; basalt gravel
Id	31-49	Fill; 5 YR 3/3 (dark reddish brown); silty clay loam; weak, fine, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; clear, smooth lower boundary; construction fill
Ie	48-106	Fill; 10 YR 3/1 (very dark gray); gravelly loam; weak, fine, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; abrupt, smooth lower boundary; contained metal utility pipe
If	86-175	Fill; 10 YR 8/2 (very pale brown); gravelly sandy clay; structureless, massive; moist, very friable consistency; plastic, mixed origin; clear, smooth lower boundary, coral gravel
Ig	120-162	Fill; 5 Y 7/1 (light gray); clay; structureless, massive; moist moist, firm consistency; very plastic; marine origin; diffuse, smooth lower boundary; hydraulic fill
II	161-190	Natural; 5 Y 4/1 (dark gray); sandy clay; structureless, single-grain; wet, slightly sticky consistency; plastic; diffuse, smooth lower boundary; wetland sediment
III	182-225	Natural; 2.5 Y 6/2 (light brown gray); coarse sand; structureless, single-grain; wet, non-sticky consistency; non-plastic; marine origin; lower boundary not visible; marine (lagoonal) sediment



T-164 glass bottle base fragment (Acc. # 164-A-1) collected from Stratum Ie

4.10 Test Excavation 165 (T-165)

***Ahupua‘a*:**	Honolulu
LCA :	387
TMK #:	2-3-002:059
Elevation Above Sea Level:	2.03 m
UTM:	618809 mE, 2355429 mN
Max Length/Width/Depth:	6.7 m/ 0.71 m/ 2.04 mbs
Orientation:	54 / 234° TN
Targeted Project Component:	Station Building
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 165 (T-165) was located approximately 49.0 m southeast of Ward Avenue and Ilaniwai Street intersection, and was located within a parking lot. T-165 was located on private property owned by Victoria Ward Ltd. No utilities were located within close proximity of T-165. The excavation surface was level with the surrounding land surface.

Summary of Background Research and Land Use Land Court Application 670 map 1 indicates that T-165 was originally situated on a large parcel of land awarded to the American Board of Commissioners for Foreign Missions (ABCFM) as part of LCA 387. The LCA testimonies indicated taro cultivation, fishpond farming, and salt production in the region. The 1884 Bishop map of Honolulu to Kewalo indicates that T-165 was located within marsh land called Kukuluaeo, 51.0 m north of LCA 10463:1, awarded to Napela. An unimproved or planned roadway is also depicted, extending northeast (*mauka*) to southwest (*makai*) within 65.0 m of T-165. The roadway is also depicted on the 1887 Wall map of Honolulu along with three structures in the vicinity of T-165. The structures were located approximately 72.0 m northwest, 80.0 m south, and 195.0 m southwest of T-165. The 1897 Monsarrat map of Honolulu depicts infrastructure development immediately north of T-165 including a near-modern street grid with the closest intersection being Ilaniwai Street and Kamani Street 122.0 m northwest and the Cyclomere bicycle track 270.0 m north. Expanded urbanization in the vicinity of T-165 is depicted throughout the series of twentieth century topographic maps and Sanborn fire insurance maps.

Few archaeological studies were conducted in the immediate vicinity of T-165. In 2000, CSH conducted archaeological monitoring for Ward Village Phase II (Ward Theaters), approximately 200.0 m southeast of T-165. A buried A-horizon and naturally-deposited pond sediments were documented in portions of the project area but, no cultural resources were assigned (Winieski and Hammatt 2001). In 2005, CSH conducted an archaeological inventory survey for the Moana Vista Project on Kapi‘olani Boulevard, located approximately 290.0 m east of T-165. No cultural resources were encountered (O’Leary and Hammatt 2006).

Documentation Limitations: T-165 was excavated to the water table at a depth of 2.04 mbs. There were no factors that limited the documentation of T-165.

Stratigraphic Summary: The stratigraphy of T-165 consisted of fill strata overlying natural sediment to the water table. Observed strata included asphalt (Ia), extremely gravely sand (Ib), silty clay loam (Ic), gravelly silty sand (Id), silty clay loam (Ie), extremely gravelly loamy sand (If), extremely gravelly clay loam (Ig), very sandy clay (Ih), clay fill (Ii), natural sandy clay (II), and coarse sand (III). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL).

Artifacts Discussion: One metal nail (Acc. # 165-A-1) was collected from Stratum Id at 0.22-0.37 mbs. The corrosion of the nail made it difficult to identify the cross-section.

Features Discussion: No features were observed

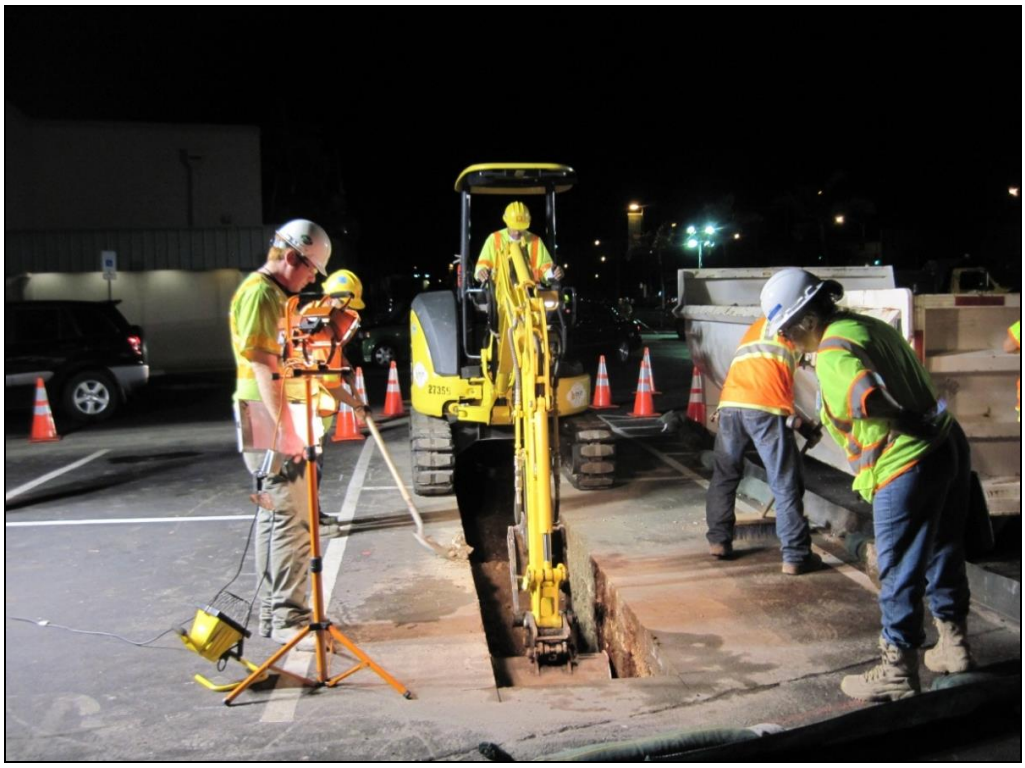
Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were individually collected during excavation.

Sample Results: One bulk sediment sample was collected from Stratum III between 1.86 and 2.04 mbs and contained charcoal (0.1g),*Tellinidae Tellina* spp. (0.1 g), Crustacean (2.2 g), Mytilidae *Brachidontes crebristriatus* (0.9 g), Ostreidae (0.7 g), and Turbinidae (0.1 g). The results of sample analysis indicate the presence of a sparse amount possible marine shell midden.

GPR Discussion: A review of amplitude slice maps indicated a linear feature that was not encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.5 mbs.

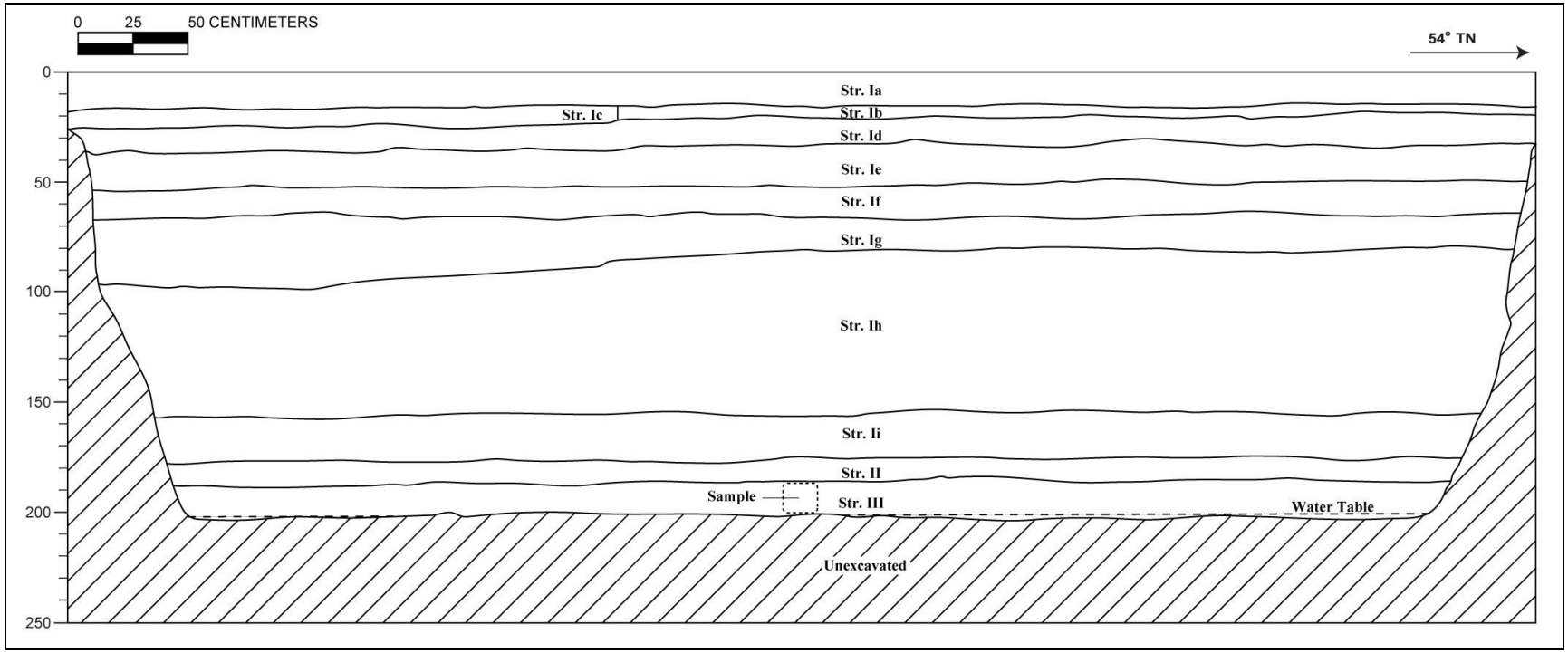
GPR depth profiles for T-165 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.3 mbs. An anomaly was observed in the profile but was not encountered during excavation. The maximum depth of clean signal return was approximately 1.0 mbs.

Summary: T-165 was excavated to the water table at a depth of 2.04 mbs. The stratigraphy of T-165 consisted of fill strata (Ia-Ii) overlying natural sediment (II-III) to the water table. The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). The results of sample analysis indicate the presence of a sparse amount possible marine shell midden. No cultural resources were observed within T-165.



T-165 general location (view to southwest)

T-165 northwest profile wall (view to west).



T-165 northwest wall profile.

T-165 Stratigraphic Description of northwest wall.

Stratum	Depth (cmbs)	Description
Ia	0-19	Asphalt; two layers
Ib	18-22	Fill; 10 YR 7/3 (very pale brown); extremely gravelly sand; structure, single-grain; moist, loose consistency; non-plastic; marine origin; very abrupt, smooth, broken/discontinuous lower boundary; crushed coral base course
Ic	19-26	Fill; 5 YR 3/3 (dark reddish brown); silty clay loam; weak, fine, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; clear, smooth broken/discontinuous lower boundary; fill deposit
Id	22-37	Fill; 10 YR 3/3 (dark brown); gravelly silty sand; weak, fine, crumb structure; moist, very friable consistency; non-plastic; terrigenous origin; clear, smooth lower boundary; contained nail
Ie	35-54	Fill; 5 YR 3/3 (dark reddish brown); silty clay loam; weak, fine, crumb structure; moist, friable consistency; slightly plastic; terrigenous origin; clear, smooth lower boundary
If	53-68	Fill; 10 YR 6/3 (pale brown); extremely gravelly loamy sand; weak, fine, crumb structure; moist, friable consistency; slightly plastic; mixed origin; clear, smooth lower boundary; crushed coral gravel
Ig	67-97	Fill; 10 YR 3/3 (brown); extremely gravelly clay loam; weak, fine, crumb structure; moist, friable consistency; slightly plastic; mixed origin; diffuse, smooth lower boundary; basalt gravel crushed coral, shell
Ih	83-157	Fill; 10 YR 8/2 (very pale brown); very sandy clay; weak, fine, crumb structure; moist, loose consistency; plastic; mixed origin; clear, smooth lower boundary; locally procured fill, sand mixed with clay
Ii	157-176	Fill; 5 Y 7/1 (light gray); clay; structureless, massive; moist, firm consistency; very plastic; marine origin; diffuse, smooth lower boundary; hydraulic fill deposit
II	176-186	Natural; 5 Y 4/1 (dark gray); sandy clay; structureless, massive; wet, slightly sticky consistency; plastic; mixed origin; diffuse lower boundary; natural marsh/wetland sediment
III	186-204	Natural; 2.5 Y 6/2 (Light brownish gray); coarse sand; structureless, single-grain; wet, non-sticky consistency; non-plastic; marine origin; lower boundary not visible; estuary sediment

4.11 Test Excavation 166 (T-166)

***Ahupua‘a*:**	Honolulu
LCA :	387
TMK #:	2-3-002:059
Elevation Above Sea Level:	2.1 m
UTM:	618811 mE, 2355418 mN
Max Length/Width/Depth:	3.70 m / 0.93 m / 2.07 m
Orientation:	296 / 116° TN
Targeted Project Component:	Station Column
USDA Soil Designation:	Fill land (FL)

Setting: Test Excavation 166 (T-166) was located approximately 58.0 m southeast of Ilaniwai Street and Ward Avenue intersection, and was located within a parking lot. T-166 was located on private property owned by Victoria Ward Ltd. The excavation surface was level with the surrounding land surface.

Summary of Background Research and Land Use: Land Court Application 670 map 1 indicates that T-166 was originally situated on a large parcel of land awarded to the American Board of Commissioners for Foreign Missions (ABCFM) as part of LCA 387. The LCA testimonies indicated taro cultivation, fishpond farming, and salt production in the region. The 1884 Bishop map of Honolulu to Kewalo indicates that T-166 was located within marsh land called Kukuluaeo, 53.0 m north of LCA 10463:1, awarded to Napela. An unimproved or planned roadway is also depicted, extending northeast (*mauka*) to southwest (*makai*) within 65.0 m of T-166. The roadway is also depicted on the 1887 Wall map of Honolulu along with three structures in the vicinity of T-166. The structures were located approximately 75.0 m northwest, 80.0 m south, and 195.0 m southwest of T-166. The 1897 Monsarrat map of Honolulu depicts infrastructure development immediately north of T-166 including a near-modern street grid with the closest intersection being Ilaniwai Street and Kamani Street 122.0 m northwest and the Cyclomere bicycle track 265.0 m north. Expanded urbanization in the vicinity of T-166 is depicted throughout the series of twentieth century topographic maps and Sanborn fire insurance maps.

Few archaeological studies were conducted in the immediate vicinity of T-166. In 2000, CSH conducted archaeological monitoring for Ward Village Phase II (Ward Theaters), approximately 200.0 m southeast of T-166. A buried A-horizon and naturally-deposited pond sediments were documented in portions of the project area but, no cultural resources were assigned (Winieski and Hammatt 2001). In 2005, CSH conducted an archaeological inventory survey for the Moana Vista Project on Kapi‘olani Boulevard, located approximately 340.0 m east of T-166. No cultural resources were encountered (O’Leary and Hammatt 2006).

Documentation Limitations: T-166 was excavated to the water table at a depth of 2.07 mbs. There were no specific factors that limited documentation of T-166

Stratigraphic Summary: The stratigraphy of T-166 consisted of fill strata overlying natural sediment to the water table. Observed strata included asphalt (Ia), very gravelly sandy loam (Ib), very gravelly sandy loam (Ic), clay loam (Id), very gravelly silty clay loam (Ie), sandy clay loam (If), very gravelly sand (Ig), sand fill (Ih), and natural sand (II). The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL).

Artifacts Discussion: No artifacts were observed.

Features Discussion: No features were observed.

Terrestrial Faunal Remains Collected During Excavation: No terrestrial faunal remains were collected individually during excavation.

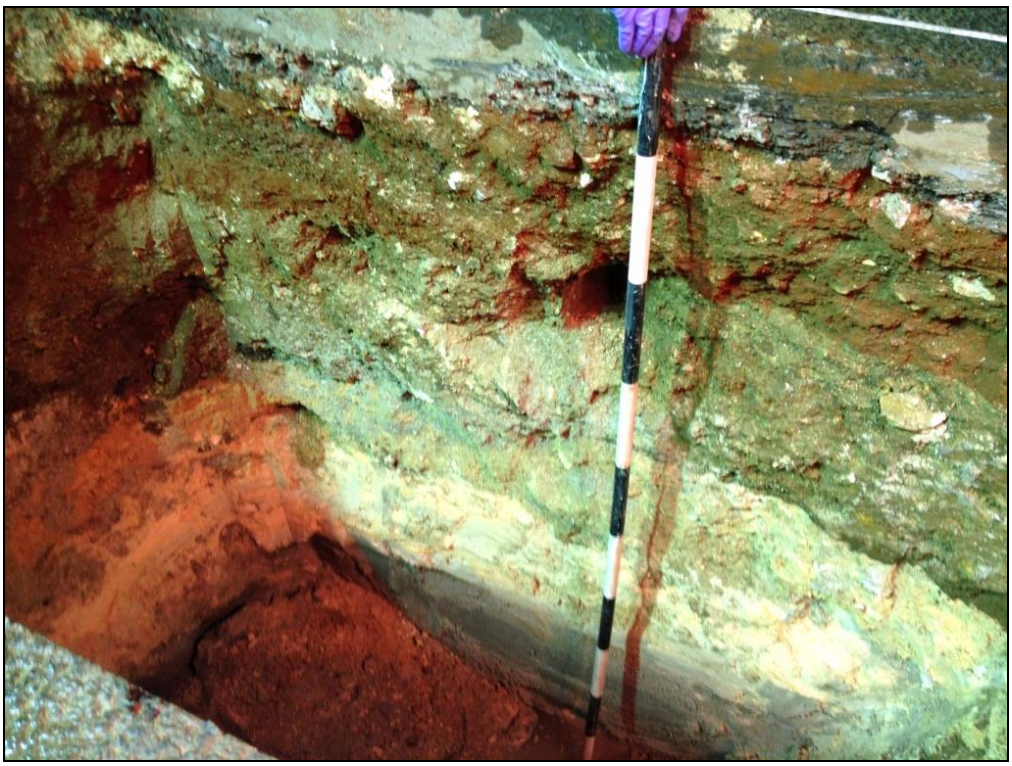
Sample Results: One bulk sediment sample was collected from Stratum II between 1.44 and 2.07 mbs. The sample was wet-screened. The bulk sample contained naturally-deposited shell (0.5g). The results of sample analysis of bulk sediment samples within Stratum II documented the presence of naturally-occurring shell.

GPR Discussion: A review of amplitude slice maps indicated no linear features although a utility was encountered during excavation. Reflectivity was relatively uniform throughout the grid and decreases with depth. A transition from higher reflectivity to lower reflectivity was observed at approximately 0.5 mbs.

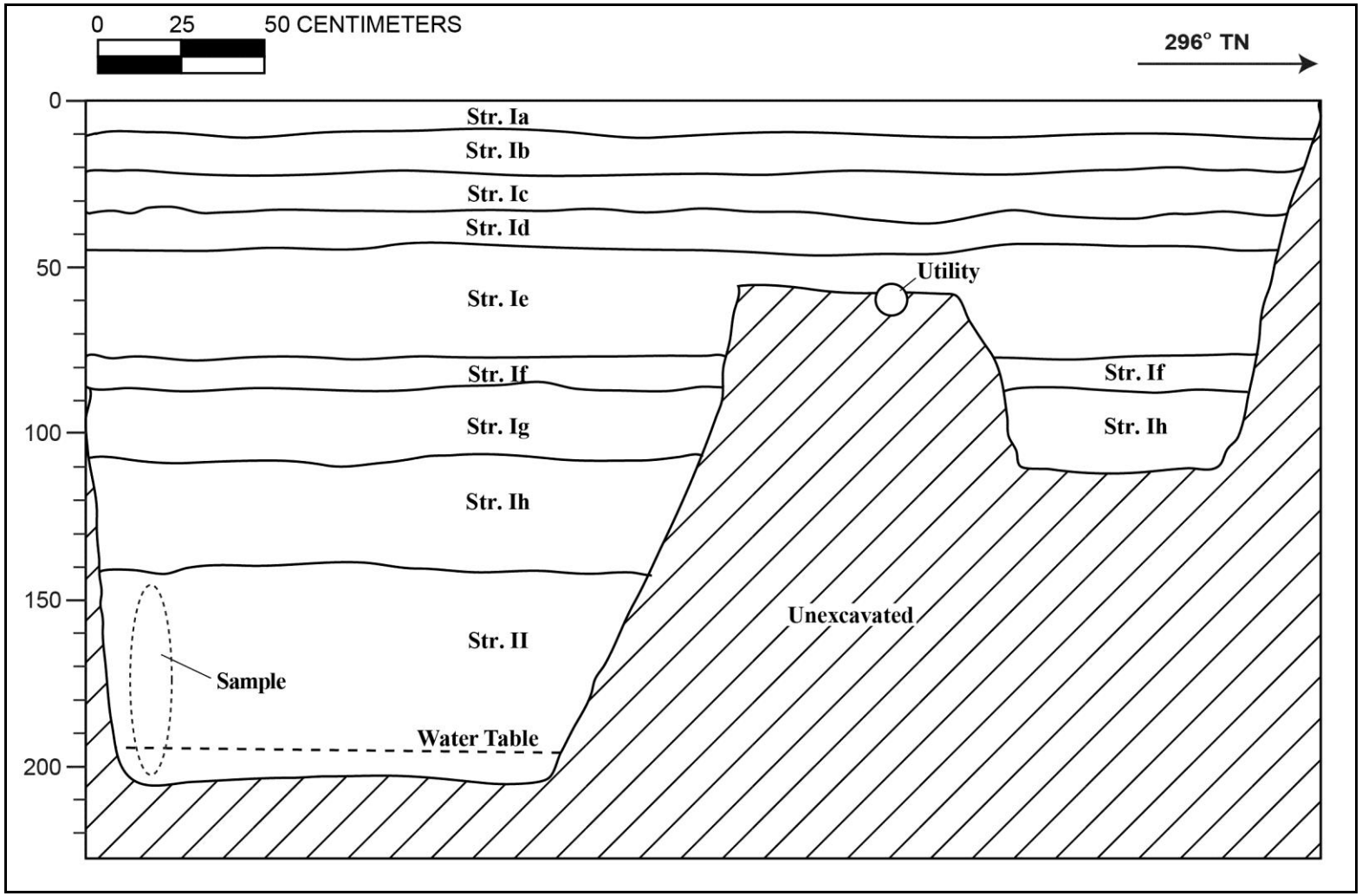
GPR depth profiles for T-166 identified horizontal banding, commonly associated with stratigraphic layering, throughout the survey area. This banding corresponded to variations of density and chemical composition within fill deposits. The profile also indicated a change in reflectivity occurring around 0.3 mbs. No utilities were observed in the profile although a utility was encountered during excavation. The maximum depth of clean signal return was approximately 0.7 mbs.

T-166 was excavated to the water table at a depth of 2.07 mbs. The stratigraphy of T-166 consisted of fill strata overlying natural sediment to the water table. The stratigraphy generally conformed to the USDA soil survey designation of Fill land (FL). One bulk sediment sample was collected from Stratum II between 1.44 and 2.07 mbs. The results of sample analysis of bulk sediment samples within Stratum II documented the presence of naturally-occurring shell. No cultural resources were identified within T-166.

T-166 general location (view to south)



T-166 southwest profile wall (view to south).



T-166 southwest wall profile.

T-166 Stratigraphy Description

Stratum	Depth (cmbs)	Description
Ia	0-13	Asphalt
Ib	13-23	Fill; 10 R 3/3 (dusky red) with common 2 mottles of 5 YR 8/1 (white); very gravelly sandy loam; weak, fine, crumb structure; moist, very friable consistency; slightly plastic; terrigenous origin; abrupt, smoother lower boundary; cement cobbles
Ic	23-36	Fill; 7.5 YR 4/3 (brown) with common 7 mottles of 7/5 YR 8/1 (white); very gravelly sandy loam; moist, very friable consistency; mixed origin; abrupt, smoother lower boundary; coral cobbles
Id	36-48	Fill; 10 R 3/2 (dusky red); clay loam; weak, fine structure; moist, very friable consistency; slightly plastic; terrigenous origin; abrupt, smoother lower boundary
Ie	48-80	Fill; 10 YR 4/3 (brown) with common 2 mottles of 10 YR 8/1 (white); very gravelly silty clay loam; moderate, fine, blocky structure; moist, very friable consistency; slightly plastic; mixed origin; abrupt, smoother lower boundary; coral cobbles
If	80-87	Fill; 7.5 YR 2.5/2 (very dark brown); sandy clay loam; weak, fine, crumb structure; moist, very friable consistency; slightly plastic; terrigenous origin; abrupt, smoother lower boundary
Ig	87-110	Fill; 7.5 YR 6/3 (light brown); very gravelly sand; structureless, single-grain; moist, loose consistency; non-plastic; mixed origin; abrupt, smooth lower boundary; contained coral cobbles
Ih	110-144	Fill; 7.5 YR 7/6 (reddish yellow); sand; structureless, single-grain; moist, loose consistency; non-plastic; marine origin; abrupt, smooth lower boundary; hydraulic fill sand
II	144-207	Natural; GLEY 1 7/5GY (light greenish gray); sand; weak, coarse, granular structure; moist, loose consistency; non-plastic; marine origin; lower boundary not visible; very fine roots; micro mollusk shells